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April 26, 2012

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5 Post Office Square, Suite 100
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Boston, Massachusetts 02109

Via e-mail: tisa.kimberly@epamail.epa.gov and Overnight Mail

**Re: Request for Approval of TSCA Risk-Based Cleanup of PCBs under 40 CFR 761
Burke Elementary School
127 Birch Street
Peabody, Massachusetts 01960
ATC Job No.: 060.41546.0006**

Dear Ms. Tisa:

Please find enclosed a request for approval of a risk-based cleanup of PCBs under the Toxic Substances Control Act, 40 CFR 761.61(c), submitted on behalf of the City of Peabody for the proposed renovation activities at the above-referenced property.

If you have any questions regarding this application, please contact Michael Gitten at (781) 404-1439 or michael.gitten@atcassociates.com.

Sincerely,

ATC Associates Inc.

A handwritten signature in blue ink, appearing to read 'Chris Amorelli'.

Chris Amorelli
Environmental Scientist

ATC Associates Inc.

A handwritten signature in blue ink, appearing to read 'Michael Gitten'.

Michael Gitten, PE, LSP
Environmental Division Manager

cc: David Keniston, City of Peabody
Vivian Low, Daedalus
Kenneth Kimmell, Commissioner, Massachusetts DEP, One Winter Street, Boston,
Massachusetts 02108
Sharon Cameron, Director, Peabody Health Department, 24 Lowell Street, Peabody,
Massachusetts, 01960



**REQUEST FOR APPROVAL OF TSCA RISK-BASED CLEANUP
OF PCBs**

**BURKE ELEMENTARY SCHOOL
127 BIRCH STREET
PEABODY, MASSACHUSETTS 01960**

APRIL 23, 2012

Prepared for:

**City of Peabody
21 Johnson Street
Peabody, Massachusetts 01960**

Prepared by:

**ATC Associates Inc.
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Woburn, Massachusetts 01801
(781) 932-9400**

ATC Project No. 060.41546.0006

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1 INTRODUCTION

ATC Associates Inc. (ATC) has prepared this request for approval of a risk-based cleanup of polychlorinated biphenyls (PCBs) (Request) under the Toxic Substances Control Act (TSCA), on behalf of the City of Peabody for the proposed renovation activities at Burke Elementary School in Peabody, Massachusetts (Site).

Sealants associated with windows and doors, and a sealant between the classroom univent units and windows have been identified as containing PCBs at concentration ≥ 50 parts per million (ppm). It is believed that the sealants were manufactured containing PCBs in a non-liquid state and since the concentration at the time of designation for disposal is ≥ 50 ppm, this material is defined by 40 CFR 761 as PCB Bulk Product Waste. Other building materials have been impacted by the PCB Bulk Product Waste and therefore are defined by TSCA as PCB Remediation Waste. The City of Peabody is planning window and door replacement activities starting June 2012 as part of a Massachusetts School Building Authority (MSBA) Green Repair Program. This Request is provided to support the proposed renovation activities where PCB Bulk Product Waste and PCB Remediation Waste have been identified.

This Request has been prepared in accordance with TSCA requirements for a risk-based cleanup plan, as outlined at 40 CFR 761.61(c). 40 CFR 761.61(c) indicates that all the information outlined in 40 CFR 761.61(a) (*Self-Implementing Cleanup*) must be provided. Therefore various references are made throughout this document to 40 CFR 761.61(a), even though this submittal is for a risk-based cleanup under 40 CFR 761.61(c).

A summary of sampling procedures, as required by 40 CFR 761.61(a)(3)(i)(B), is provided in Section 2. Information on the nature of PCB contamination and location and extent of contamination, as required by 40 CFR 761.61(a)(3)(i)(A) and (C), is provided in Section 3. Section 5 provides the cleanup plan information required by 40 CFR 761.61(a)(3)(i)(D). The certification required by 40 CFR 761.61(a)(3)(i)(E) is included in Section 6.

The following is information regarding the entity submitting this Request:

Entity: The City of Peabody

Contact: David Keniston
School Business Manager
City of Peabody
21 Johnson Street
Peabody, Massachusetts 01960
kenistond@peabody.k12.ma.us

Telephone: (978) 536-6520

2 SITE BACKGROUND AND HISTORY

This Section provides Site information, including Site location, history and description. Section 2.3 includes information on PCB characterization sampling, as required by 40 CFR 761.61(a)(3)(i)(B).

2.1 GENERAL LOCATION

The Site consists of the Burke Elementary School building (the “Site”) surrounded by landscaped and asphalt and concrete paved areas. A playground is located to the east of the school building. The Site is located to the west of Birch Street in a residential neighborhood. Site access is provided from the west via Birch Street. A Site vicinity map showing the location of the Site is provided as Figure 1.

2.2 SITE HISTORY AND DESCRIPTION

The Site is a two-story building which was constructed in approximately 1965 and is currently utilized as an elementary school (kindergarten through 5th grade). Site renovations are proposed to take place starting June 2012 (following the completion of the school year) as part a Massachusetts School Building Authority (MSBA) Green Repair Program. Renovations will include replacement of windows and exterior doors throughout the Site.

In support of the proposed renovations, Covino Environmental Associates (Covino) completed an initial semi-quantitative window sealant survey for PCBs on May 6, 2011. This consisted of collecting four (4) composite window sealants (two window frame caulk and two window glazing samples) for the analysis of PCB. The samples were collected from various areas and composited. The initial sampling indicated that PCBs were present in interior window caulk at 43,600 ppm, exterior window caulk at 54,400 ppm, interior window glazing at 38.1 ppm, and exterior window glazing at 2.71 ppm. Based on the results of this initial survey, ATC conducted additional sampling to determine the extents of PCB impacts in various media throughout the Site, as discussed in the following section.

Sealant samples were also analyzed for asbestos. Asbestos was detected in the interior window frame caulk (2% chrysotile asbestos) and exterior window glazing (3% to 7% chrysotile asbestos). Asbestos was not detected in the interior window glazing or exterior window frame caulk.

Based upon the discovery of PCB containing building materials, a number of interim measures were implemented to control potential exposure to PCBs until abatement could be completed in consultation with the EPA and EPA documents on implementing interim measures including Fact Sheet for Schools (EPA-747-09-003) and Current Best Practices for PCBs in Caulk Fact Sheet, Interim Measures for Assessing Risk and Taking Action to Reduce Exposure (October 2009). These interim measures include:

- Cleaning accessible portions of the univent interiors;
- Increasing the frequency of changing out univent filters;
- Optimizing univent fresh air exchanges;
- Utilizing HEPA equipped vacuum cleaners;
- Covering the limited amounts of exposed caulk within the building;
- Utilizing damp dusting techniques;
- Covering accessible interior window sills with surface wipe PCB concentrations > 1 µg/100 cm²; and
- Limiting use of second floor rooms where the higher indoor air PCB concentrations had been observed to administrative and non-classroom functions.

During this program, univent filters, vacuum debris, and recovered floor wash wastewater are being containerized and managed off-Site as PCB containing waste. To date, solids have been

sent to EQ's Wayne Disposal TSCA landfill in Bellevue, Michigan.

2.3 PCB CHARACTERIZATION SAMPLING

To determine the extent of PCB containing materials ATC collected various samples between October 15, 2011, and February 14, 2012, and submitted a total of two hundred and eight (208) samples from the Site for laboratory analysis for PCB content. Samples consisted of the following materials:

1. Sealants (i.e., window and door frame caulking, and window glazing);
2. Porous building materials (i.e., concrete, brick, and concrete masonry unit (CMU));
3. Surface wipes from both nonporous (metal) and porous surfaces (i.e. painted CMU and varnished wood);
4. Paint from the interior walls;
5. Univent interior material samples (i.e. air filters, insulation, and debris/grease);
6. Cleaning debris (vacuum cleaner waste, floor wash wastewater);
7. Soil samples from areas adjacent to the Site and within the playground area; and
8. Indoor air.

Bulk and wipe samples were generally collected from areas that would be most accessible to students.

Bulk samples were collected via hand tools (i.e., utility knife, hammer, chisel, etc.) which were used one time or decontaminated with a hexane-wetted rag after the collection of each sample. The samples were collected in consultation with the EPA Standard Operation Procedure for Sampling Porous Surfaces (May 5, 2011). All masonry samples were collected from within 1/2-inch of the surface.

Wipe samples were collected per standard wipe test protocols in accordance with 40 CFR § 761.123 utilizing the applicable procedures identified in Wipe Sampling and Double Wash/Rinse Cleanup as Recommended by the EPA PCB Spill Cleanup Policy (June 23, 1987, Revised and Clarified on April 18, 1991). A one-use template was used to delineate each 100 square-centimeter (cm²) sampling area.

The wipe and bulk samples were submitted for chemical extraction for PCBs using EPA Method 3540C of SW-846 (Soxhlet extraction) and chemical analysis for PCB Aroclors using EPA Method 8082 of SW-846, with the exception of 3 paint chip samples which were analyzed for PCB homolog by EPA Method 680 Modified.

Air samples were collected using a Polyurethane Foam (PUF) Media cartridge following EPA Method TO-10A, Determination of Pesticides and PCBs in Ambient Air Using Low Volume. The air samples were submitted for PCB homologue analysis by EPA Method 680 Modified, except for one sample analyzed for Aroclors by EPA Method 8082. Prior to their use sampling pumps were calibrated. The PUF cartridge was placed in the center of the room being sampled at approximately three to four feet from the ground to replicate student breathing zone elevation. During sampling the univents were run as they are during the school day.

All samples were submitted to Contest Analytical Laboratory, Inc. (Contest) of East Longmeadow, Massachusetts for laboratory analysis.

Based upon visual observations, window and door sealants are summarized in the following table:

WINDOW AND DOOR SEALANT LOCATIONS				
Setting	Interior		Exterior	
	Surround Caulk	Window Glazing	Surround Caulk	Window Glazing
Classroom Window Assemblies	X	X	X	X
Large Cafeteria / Gym Translucent Windows	-	X	-	X
Small Cafeteria / Gym Windows	-	X	X	X
Hallway Window Units	X	X	X	X
Combination Door / Window Assemblies	X	X	X	X
Doors	-	-	X	-

X = Sealant present

The following summarizes sample collection activities. Approximate sample locations are depicted on Figures 2 and 3. These Figures show the approximate location of individual samples as well as sample series, where applicable (e.g. building material samples which were collected at incremental distances from suspect sealants (adjacent, 6", and 12")). Photographs in Appendix A show typical sampled material types. Table1 summarizes the sampling program.

May 6, 2011

- Covino completed the initial semi-quantitative window sealant survey consisting of one composite sealant sample from interior and exterior window frame caulk and window glazing for a total of four (4) samples.

October 15, 2011

- Five (5) wipe samples of accessible interior metal adjacent to windows (sills, Univents, shelving units) and painted CMU walls adjacent to the windows. These samples were collected to determine if materials adjacent to windows containing PCB Bulk Product sealants have been impacted by PCBs and if these PCBs have the potential to be transferred to skin by direct contact. Samples were collected from Rooms 108 and 110.
- Five (5) indoor air samples to determine if indoor air contained PCBs. The samples were collected from Rooms 108, 110, 114, and 205 and cafeteria. Samples were collected over approximately three hours between 10:00 am and 1:00 pm.

November 21, 2011

- After initial interim measures were completed (cleaning univents, changing univent filters, covering exposed interior window caulk), ten (10) indoor air samples were collected over an approximately four hour period. Samples were collected to determine PCB indoor air impact extent and effectiveness of initial interim measures. Samples were collected from Rooms 104, 108, 110, 116, 201, 205, and the guidance office. A field blank was also submitted.

December 10, 2011

- Forty (40) interior and exterior window frame caulk and glazing samples to determine the extent of PCB-containing window sealants throughout Site. Samples were collected from various interior and exterior classrooms on the first and second floor, stairwell B, the second floor hallway, and the cafeteria.
- Thirty-two (32) interior and exterior painted CMU and brick window surround samples to determine if materials adjacent to windows have been impacted by PCBs. The samples were collected from various interior and exterior classrooms on the first and second floor, stairwell B, the second floor hallway, and the cafeteria.
- Four (4) interior and exterior window sill wipes to determine if materials adjacent to windows have been impacted by PCBs. The samples were collected from Rooms 108, 110, and 205.

December 19-20, 2011

- Three (3) wipe samples were collected from a univent interior and one (1) debris/grease sample from a univent to determine PCB impacts. The samples were collected from the univent in Room 205. This univent has a newer motor (installed within the last 10 years), and therefore the motor and associated controls would not be a potential PCB source.
- Thirty one (31) indoor air samples to determine to determine extents of PCB indoor air impacts throughout the Site. The samples were collected from all classrooms, the cafeteria, gymnasium, kitchen, and outdoors. A field blank was also submitted. Samples were collected over approximately six hours between 6:00 pm and 1:00 am.

December 27, 2011

- Eight (8) interior CMU window surround and random area CMU (away from PCB containing sealant) samples to determine if materials adjacent to windows and random area have been impacted by PCBs. The samples were collected from Rooms 108, 110, and 205, stairwell B, and the second floor hallway.
- Eight (8) wipe samples of areas accessible to students: interior metal window sills (top of shelving and univents adjacent to windows) and walls adjacent to the windows to determine if they have been impacted by PCBs. The samples were collected from Rooms 101, 110, 201, 202, and 205.

January 11, 2012

- Four (4) soil/gravel samples to determine if soil adjacent to building and in playground area has been impacted by PCBs. The samples were collected from areas adjacent to the Site (outside Rooms 108, 109 and 112) and within the playground area.

January 16, 2012

- Eight (8) exterior CMU, concrete, and brick window surround samples to determine if materials adjacent to windows have been impacted by PCBs. The samples were collected from Rooms 101, 108, 110, 112 and 116.

- Thirteen (13) exterior concrete and brick door surround samples to determine if materials adjacent to doors have been impacted by PCBs. The samples were collected from Doors 1, 2, 3, 4, 6 and 9.
- Six (6) univent wipes, two (2) univent air filter samples, and two (2) univent insulation samples to determine if the interior univent materials have been impacted by PCBs. The samples were collected from the univents in Rooms 204 and 205.
- Three (3) interior wall paint samples to determine if the interior paint contains PCBs. The samples were collected from the Rooms 110 and 205, and the second floor hallway.
- Two (2) vacuum cleaning debris samples to determine if cleaning debris contains PCBs. The samples were collected from a push vacuum and backpack vacuum.
- Four (4) indoor air samples to monitor PCB indoor air concentrations as part of a monthly sampling program. The samples were collected from Rooms 105, 114, and 202. A field blank was also submitted. Samples were collected over approximately eight hours between 7:30 am and 3:30 pm.. A fifth sample was collected, however the PUF sample broke during the sampling event and could not be submitted for laboratory analysis.

January 20, 2012

- Three (3) exterior door frame caulk samples to determine the extent of PCB-containing door frame sealants throughout the Site. The samples were collected from Doors 3, 4 and 9.

February 14, 2012

- Three (3) interior wall paint samples to determine if the interior paint contains PCBs. The samples were collected from the Room 105, the first floor interior hallway, and the second floor hallway.
- Six (6) wipe samples of interior CMU walls to determine if the painted walls in various areas contain or have been impacted by PCBs, and if present, if they had the potential to be transferred to skin by direct contact. The samples were collected from Rooms 105, 110, 205, the first floor interior hallway, and second floor hallway.
- One (1) wastewater sample from the maintenance floor cleaner to determine if washwater generated during floor cleaning contains PCBs.
- Six (6) indoor air samples to monitor PCB indoor air concentrations as part of a monthly sampling program. The samples were collected from Room 103, 105, 111, 114, and 202. A field blank was also submitted. Samples were collected over approximately eight hours between 4:00 pm and 12:30 am.

ATC also completed a visual survey of representative fluorescent light ballast for the Site with the assistance of City of Peabody personnel. Based on the observed conditions and information provided by the City of Peabody, fluorescent light fixtures, including ballasts and capacitors, within the hallway areas were replaced in 2002 and within the classrooms in 2008. ATC

observed no evidence of staining from past ballast and capacitors. Based on the results of this survey, it is unlikely that fluorescent light ballasts are a source of PCBs at the Site.

2.4 PCB LABORATORY ANALYSIS RESULTS

The following summarizes laboratory analytical results for each type of media sampled as described in Section 2.3. Tables summarizing the bulk material and indoor air laboratory results are attached. Laboratory analytical reports are enclosed in Appendix B. As shown on Table 3, Aroclors 1248 and 1254 were observed in the bulk and wipe samples. Aroclor 1248 was used as a plasticizer, hydraulic oils or adhesives and Aroclor 1254 is often associated with sealants such as caulk and glazing. As shown on Table 5, the observed homologs were hexachlorobiphenyls and lower chlorinated compound, with trichlorobiphenyls followed by tetrachlorobiphenyls the most common. The lower chlorinated homologs, as observed at this Site, have a lower toxicity.

Interior Window Sealants

Interior Window Frame Caulk

Samples of gray interior window caulk were collected from four classrooms, stairwell B, and the second floor hallway (IWC-108, 110, 201, 205, SWB, and HW) for a total of six (6) samples. PCBs concentrations ranged from 65,000 to 87,000 ppm, qualifying the material as PCB Bulk Product Waste. This material was observed along the vertical window frames joints in all classrooms, stairwells, and hallways. This material is believed to be a source of the PCBs observed in various interior media (i.e. indoor air, CMU, univents, etc.) discussed below.

A limited amount of white interior window caulk was observed. A sample was collected from the horizontal window frame joint where it meets the univent in Room 113 (IWC-113). The material appeared to be a repair caulk which was limited to Room 113. The material had a PCB concentration of 31.5 ppm. ATC assumes this concentration is from underlying or residual gray caulk that is a PCB Bulk Product Waste. ATC therefore classifies this material as a PCB Remediation Waste.

Interior Window Frame Glazing

A total of four (4) samples of gray interior window glazing were collected from three classrooms and stairwell B (IWG-110, 201, 205, and SWB). PCBs concentrations ranged from 117 to 290 ppm. ATC classified this material as PCB Bulk Product Waste. This material was observed along window frames in all classrooms and stairwells.

A total of six (6) samples of black interior window glazing were collected from four classrooms, the second floor hallway, and the cafeteria (IWG-108, 110B, 201B, 205B, HW, and CafeB). PCBs concentrations ranged from 86 to 360 ppm, qualifying the material as PCB Bulk Product Waste. This material was observed along window frames in all classrooms, hallways, and large cafeteria and gymnasium translucent windows. Glazing within the cafeteria and gymnasium is only present on the outer portion of the window frames and not within the windowpane dividers.

A limited amount of clear glazing was present in the small windows in the cafeteria. One (1) sample (IWG-CafeA) was collected. The material was limited to the small windows within the cafeteria and gymnasium. The material had a PCB concentration of 23 ppm. ATC assumes this concentration is from underlying or residual gray caulk that is a PCB Bulk Product Waste. ATC therefore classifies this material as a PCB Remediation Waste.

A limited amount of white glazing was observed in Room 110. The material was limited to Room 110. One (1) sample (IWG-110C) was collected. The material had a PCB concentration of 31 ppm. ATC assumes this concentration is from underlying or residual gray caulk that is a PCB Bulk Product Waste. ATC therefore classifies this material as a PCB Remediation Waste.

Interior Window Frame Sill/Univent Rubber Sealant

Three (3) samples of gray interior window apparently rubber sealant present between the univents and windows were collected from three classrooms (IWR-110, 201, and 205). PCBs concentrations ranged from 6,000 to 31,700 ppm, qualifying the material as PCB Bulk Product Waste. This material was observed between the univent and window assemblies in all classrooms. This material is believed to be a source of the PCBs observed in various interior media discussed below.

Interior Building Materials

Interior CMU

To determine if interior window PCB Bulk Product Waste caulk had impacted adjacent CMU surfaces, ATC collected surficial CMU samples adjacent, 12 inches, and two feet from the window frame caulk in Rooms 108, 110, and 205, stairwell B, and the second floor hallway (ICMU-108, 110, 205, SWB, and HW Adj, 12", and 2") for a total of fifteen (15) samples. All surfaces were painted. PCB concentration in adjacent CMU samples ranged from 24 to 370 ppm. PCB concentration in 12 inch CMU samples ranged from 1.65 to 42 ppm. PCB concentration in two foot CMU samples ranged from 1.5 to 12.9 ppm.

Based on these results, three (3) painted CMU samples from areas located away from the windows known to contain PCB Bulk Product sealants were collected to determine PCB impact extent ("random" area samples). The concentrations in the random CMU samples ranged from 5.1 to 6.9 ppm, indicating that PCBs may be present at ≥ 1 ppm in painted interior CMU throughout the Site.

Interior Paint

All interior CMU sampled to date have PCB concentrations > 1 ppm. All of these samples were from painted CMU surfaces. Should these levels be due to the PCB sealants, TSCA requires that the painted surfaces be remediated. Based on the results of previous sampling, the PCB levels on painted concrete samples do decline away from the PCB-containing window frame caulk and then appear to level off. ATC hypothesized that the lower levels may have been associated with terphenyls that are sometimes added to paints. Terphenyls may show up as PCBs when the standard Aroclor EPA 8082 analytical method is used for previous sampling efforts.

To determine if the lower levels are "false" positives and therefore not subject to EPA regulations, three (3) paint samples were collected from Rooms 110 and 205, and the second floor hallway (PC-110, 205, and HW) and submitted for PCB homologue analysis. This method is less susceptible to "false" positive PCB readings due to the presence of terphenyls. These sample areas were chosen based the location with the highest PCB concentration in CMU from a random area (Room 110), location with the highest PCB concentration in CMU two feet from caulk (Room 205), and location with the lowest PCB concentration in CMU two feet from caulk (PC-HW).

PCBs were detected at concentrations of 96.6, 142, and 35 ppm, respectively, indicating that the paint does contain PCBs. The higher levels were observed near known PCB Bulk Product sealant, indicating that these materials may be the source of observed homologs. Homologs (specifically trichlorobiphenyls and tetrachlorobiphenyls) were detected in the laboratory blank sample. However, as discussed in the following section, ATC does not believe this affects data usability.

To determine if the extents of interior paint PCB impacts in areas not associated with PCB-contaminated caulk, ATC collected an additional three (3) samples from areas away from known PCB Bulk Product sealants. PCB concentrations in these samples ranged from 47 to 64 ppm, indicating that PCBs may be present at 1 ppm in paint throughout the Site interior, with the highest values (370 ppm) present directly adjacent to PCB Bulk Product caulk.

Interior Wipe Samples

To support evaluating potential dermal exposure to PCBs by building occupants, ATC completed interior surface wipe sampling from various representative areas. For non-porous materials (such as metal or glass), TSCA requires that they must be abated if PCB concentrations are $\geq 10 \mu\text{g}/100 \text{ cm}^2$. For porous materials (such as wood or painted masonry or wood surfaces) the wipes are an indicator of the presence of PCBs and their ability to transfer to skin by direct contact. PCBs are considered present and potentially available for transfer to skin at a level of potential concern by direct contact if wipe concentrations are $\geq 1 \mu\text{g}/100 \text{ cm}^2$. Samples were collected from accessible areas.

Interior Metal Window Sill / Univent top Wipes

ATC collected six (6) wipe samples from the metal window sills/univent top adjacent to the window frames in Rooms 101, 108, 110, 201, 202, and 205 (IW-101, 108-Sill, 110-Sill, IW-201, IW-202, and IW-205). PCB concentration in the IW-101, 108-Sill, and IW-201 samples were non-detect. PCB concentrations in the 110-Sill, IW-202, and IW-205 samples were $1.2 \mu\text{g}/100 \text{ cm}^2$, $0.21 \mu\text{g}/100 \text{ cm}^2$, and $36.2 \mu\text{g}/100 \text{ cm}^2$, respectively. ATC believes that the 36.2 and $1.2 \mu\text{g}/100 \text{ cm}^2$ concentrations were due to wipe contact with the adjacent PCB Bulk Product surround caulk.

To confirm ATC's hypothesis, additional samples were collected from Room 205. Sample IW-205-2 was collected at a similar location as IW-205 and sample IW-205-C was collected after the area was cleaned with hexane. Both samples were non-detect, with a detection level of $0.20 \mu\text{g}/100 \text{ cm}^2$. An additional sample was collected from the same general location where the $1.2 \mu\text{g}/100 \text{ cm}^2$ concentration was observed in Room 110. The second sample did not report PCBs above the $0.20 \mu\text{g}/100 \text{ cm}^2$ detection limit. This confirmed ATC hypothesis that the 36.22 and $1.2 \mu\text{g}/100 \text{ cm}^2$ were not representative.

Based on the results of the window sill/univent exterior wipe sampling, PCBs may be present on the metal window sills/univent exterior in the classrooms, but at concentrations $< 1 \mu\text{g}/100 \text{ cm}^2$.

Interior Laminated Window Shelf Wipes

ATC collected two (2) wipe samples from the laminated (non-porous) window shelves adjacent to the window sill in Rooms 108 and 110 (108-Shelf and 110-Shelf). PCB results were non-

detect and $0.35 \mu\text{g}/100 \text{ cm}^2$, respectively. This indicates that PCBs would not transfer to skin via direct contact at a level of concern. The shelves are present in all of the classrooms.

Interior Wood Window Sill Wipes

ATC collected one (1) wipe sample from the wooden window sill adjacent to the small window in Room 108 (IW-108). These windows are present only in the six corner classrooms (Rooms 101, 108, 109, 116, 201, and 208). The PCB concentration of the one sample was $4.3 \mu\text{g}/100 \text{ cm}^2$. Based on the results of the window shelf wipe sampling, PCBs appear to be present on the small window wooden sill in the corner classrooms. These window sills will be removed during the window replacement project. As an interim measure, ATC nailed wood planks over the top of the sill and the front face of the sill to encapsulate the material until it is removed.

Interior CMU Wall Wipes

ATC collected a total of four (4) wipe samples from the CMU wall adjacent to the window frame in Rooms 101, 108, 110, and 205 (IW-101W, 108-Wall, IW-110W, and IW-205W). PCB results were non-detect for IW-101W and 108-Wall, $0.32 \mu\text{g}/100 \text{ cm}^2$ for IW-110W, and $0.47 \mu\text{g}/100 \text{ cm}^2$ for IW-205W.

ATC collected six (6) wipe samples from the CMU wall area where the paint samples were previously collected (IW-PC-110, 205, HW, IHWR, 105R, and HWR). PCBs were not detected in the submitted wipe samples.

This data indicates that PCBs would not transfer readily to skin via direct contact at a level of concern.

Univents

ATC initially collected samples of univent debris/grease and interior wipe samples, as discussed below, to determine if PCBs were present. Based upon the fact that PCBs were observed in these materials additional sampling was performed to determine the extent of PCB impacts within the univents, their potential to be a continuing source and the ability to decontaminate them. The investigation involved sampling interiors with original motors (e.g. Room 204) and newer (installed within the last 10 years) motor configuration (Room 205) to support evaluating if the motors and controls are a PCB source. Univents that have fresh air intakes are located in the classrooms.

Interior Univent Interior Debris

ATC collected one (1) sample of debris/grease from within the univent interior in Room 205 (VD-205). The PCB concentration was 440 ppm. Based on the result of the debris/grease sampling, ATC collected wipe samples of the interior metal sidewall, as discussed below.

Interior Univent Air Filter

ATC collected two (2) samples of the air filters from within the univents in Rooms 204 and 205 (VAF-204 and 205). PCBs concentrations were 27 and 35 ppm, respectively, indicating that the univent air filters should be handled as PCB containing waste.

Interior Univent Insulation

ATC collected two (2) samples of the insulation located within the top of univents in Rooms 204 and 205 (VI-204 and 205). PCBs concentrations were 41 and 1.89 ppm, respectively, indicating that the univent insulation should be handled as PCB Remediation Waste when removed.

Interior Univent Exhaust Area Wipes

ATC collected one (1) wipe sample from the interior exhaust area within the univent in Room 205 (VEW-205). The PCB concentration of the one sample was 1.1 $\mu\text{g}/100\text{ cm}^2$. ATC then cleaned the interior exhaust areas with a hexane wetted rag and collected two (2) wipe samples from the cleaned interior exhaust area within the univents in Rooms 204 and 205 (VEW-204C and 205C). PCBs were not detected in the submitted post-cleaning samples.

Interior Sidewall Area Wipes

ATC collected one (1) wipe sample from the interior sidewall within the univent in Room 205 (VSW-205). The PCB concentration of the one sample was 19 $\mu\text{g}/100\text{ cm}^2$. ATC then cleaned the interior exhaust areas with a hexane wetted rag and collected two (2) wipe samples from the cleaned interior exhaust area within the univents in Rooms 204 and 205 (VSW-204C and 205C). PCBs were detected at concentrations of 0.65 and 1.27 $\mu\text{g}/100\text{ cm}^2$, respectively, after cleaning.

Interior Univent Motor Cabinet Wipes

To evaluate the effectiveness of cleaning univent interiors, ATC collected two (2) wipe samples from the interior motor cabinet sidewall within the univents in Rooms 204 and 205 (VMW-204C and 205C) after cleaning the interior motor cabinet sidewall areas with a hexane wetted rag. PCBs were not detected in the submitted samples.

In summary for the Univents:

- In all cases, the PCB levels observed in “cleaned” areas were below the 10 $\mu\text{g}/100\text{ cm}^2$ TSCA cleanup criteria for non-porous surface. This demonstrates that the metal surfaces can be cleaned with hexane or other material designed to clean PCB-impacted metal surfaces to levels as summarized below and on the enclosed PCB in Building Material Table.
- ATC did not observe a significant difference between PCB concentrations between rooms with new versus older motors. This result, coupled with the air data that also does not show a difference between old and new motors, indicates that the motors are not a PCB source.

Exterior Window Sealants

Exterior Window Frame Caulk

Six (6) samples of gray exterior window caulk were collected from four classrooms, stairwell B, and the second floor hallway (EWC-108, 110, 112, 116, SWB, and HW). The window units extend from the first to second floor in the rear of the building. PCBs concentrations ranged from 99,000 to 137,000 ppm, qualifying the material as PCB Bulk Product Waste. This material was observed along the vertical window frames joints of all classrooms, stairwells, and hallways.

This material is believed to be a source of the PCBs observed in various adjacent exterior media (i.e. concrete, CMU, brick), as discussed further below.

One (1) sample of gray exterior window caulk was collected from the cafeteria small window (EWC-Cafe). The material had a PCB concentration of 4.7 ppm, remediation waste. The material was limited to the small cafeteria and gymnasium windows (no caulk was observed around large windows).

Exterior Window Frame Glazing

A variety of exterior window frame glazings were observed. PCB concentrations ranged from non-detect to 154 ppm. Based upon the fact that the glazings are present in close proximity to a PCB Bulk Product sealant (either an interior glazing on the same window or nearby surround caulk), all the exterior glazing is considered a PCB Remediation Waste. Exterior glazing was observed at all window units.

Exterior Building Materials

Exterior CMU Window Surround

To determine if PCBs are present at ≥ 1 ppm in the vertical CMU surrounds adjacent to window frame with PCB-containing sealants, ATC collected CMU samples adjacent and 12 inches from the window frame joints outside Rooms 110 and 112, stairwell B, and the second floor hallway (ECMU-110, 112, SWB, and HW Adj and 12") for a total of eight (8) samples. PCB concentration in adjacent CMU samples ranged 40 to 780 ppm. PCB results from 12 inch CMU samples ranged from non-detect to 0.19 ppm.

Based on the above data, PCBs were not detected ≥ 1 ppm in the submitted 12 inch samples, indicating that the CMU surround within 12 inches from the vertical window frame is a PCB Remediation Waste.

Exterior Brick Window Surround

To determine if PCBs are present at ≥ 1 ppm in the vertical brick surrounds adjacent to vertical window frame with PCB-containing sealants, ATC collected brick samples adjacent, six, and 12 inches from the window frame joints outside Rooms 101, 108, 116, and the cafeteria (EBRK-101, 108, 116, and Cafe Adj, EBRK-101 and 116 6", and EBRK-108 and Café 12") for a total of eight (8) samples. Brick window surrounds are present only in the six corner classrooms (Rooms 101, 108, 109, 116, 201, and 208), cafeteria, gymnasium, Side A windows (main doors), and Side C bathroom windows.

PCB results in adjacent brick samples ranged non-detect to 3.2 ppm. PCBs were not detected in six and 12 inch brick samples. Based on these results, PCBs were not detected ≥ 1 ppm in the submitted six and 12 inch samples, indicating that the brick surround within six inches from the vertical window frame is a PCB Remediation Waste.

Exterior Concrete Window Sill

The exterior window sills consist of a horizontal poured or parged concrete surface on a vertical concrete sill. To determine if PCBs are present at ≥ 1 ppm in the horizontal poured concrete window sill adjacent to vertical window frame with PCB-containing sealants, ATC collected concrete samples adjacent, six inches (edge of vertical parged surface), and 12 inches from the

window frame joints outside Rooms 108, 110, and 112, stairwell B (ECON-108, 110, 112, and SWB Adj, 6", and 12") for a total of twelve (12) samples. PCB concentration in adjacent concrete samples ranged from 0.25 to 43 ppm. PCB results from the six inch concrete samples ranged from non-detect to 0.72 ppm. PCB results from the 12 inch concrete samples ranged from non-detect to 0.37 ppm.

Based on the above data concrete within six inches from the vertical window frame (i.e. the parged horizontal surface above the vertical face of the window sill) is a PCB Remediation Waste.

Exterior Wipe Samples

Exterior Metal Window Surround Wipes

ATC collected one (1) wipe sample from the metal window surround adjacent to the top of small window outside Room 108 (EW-108). These windows are present only outside the six corner classrooms (Rooms 101, 108, 109, 116, 201, and 208) and Side C bathroom windows. The PCB concentration of the one sample was 8.4 µg/100 cm². Based on the results of the window surround wipe sampling, PCBs may be present on the metal window surrounds, but at a level below which abatement would be required.

Exterior Door Frame Settings

Exterior Door Frame Caulk

Three (3) samples of gray exterior door caulk were collected from Doors 3, 4, and 9, which are located on Sides B and D (north and south elevations, respectively) (EDC-D3, D4, and D9). PCBs concentrations ranged from 73,000 to 110,000 ppm, qualifying the material as PCB Bulk Product Waste. This material was observed along the door frames joints of the six (6) Side B and D doors.

Exterior Brick Door Surrounds

To determine if PCBs are present at ≥ 1 ppm in the brick surrounds adjacent to the Side B and D door frames with PCB-containing sealants, ATC collected three (3) brick samples adjacent, to Door 3, 4, and 9 door frame joints (EBRK D3, D4, and D9 Adj). PCBs were not detected ≥ 1 ppm (ranging from not detected to 0.63 ppm) in the submitted samples, indicating that the brick door frame surrounds are not a PCB Remediation Waste. However, as a conservative measure, the area where PCB containing caulk is removed will be abated as if it is a PCB Remediation Waste.

Exterior Concrete Thresholds

To determine if PCBs are present at ≥ 1 ppm in the concrete thresholds that are present at the Side A and C doors (main and rear doors located the west and east elevations, respectively), ATC collected four (4) concrete samples adjacent and six inches from Doors 1 and 6 (ECON-D1 and D6 Adj and 6"). The two adjacent samples (ECON-D1 Adj and ECON-D6 Adj) had PCB concentrations of 1.63 and 180 ppm, respectively. PCBs concentrations of the six inch samples were 0.54 and 0.28 ppm, respectively, indicating that the concrete threshold six inches from the Side A and C door frames is not a PCB Remediation Waste.

To determine if PCBs are present at ≥ 1 ppm in the concrete thresholds that are present at the Side B and D doors, ATC collected four (4) concrete samples adjacent and six inches from Doors 2 and 9 (ECON-D2 and D9 Adj and 6"). The two adjacent samples (ECON-D2 and D9 Adj) had PCB concentrations of 0.14 and 0.63 ppm, respectively, and PCBs were not detected in the two six inch samples (ECON-D2 and D9 6"). PCBs were not detected ≥ 1 ppm in the submitted samples, indicating that the concrete threshold from the Side B and D door frames is not a PCB Remediation Waste. However, as a conservative measure, the area where PCB containing caulk is removed will be abated as if it is a PCB Remediation Waste.

Cleaning Byproducts

Vacuum Cleaner Debris

To determine if PCBs are present at ≥ 1 ppm in debris within the maintenance vacuum cleaners, ATC collected debris samples from the two maintenance vacuums. Sample CD-1 was collected from the push vacuum. Sample CD-2 was collected from the backpack vacuum. The backpack vacuum was utilized to clean debris generated during an invasive univent investigation the same day the sample was collected. PCBs were detected at concentrations of 6.3 ppm in the push vacuum and 12.5 ppm in the backpack vacuum debris. Based upon these levels, vacuum cleaner debris should be handled as PCB containing waste.

Floor Cleaner Wastewater

To determine if PCBs are present at ≥ 1 ppm in wastewater within the floor cleaner machine, ATC collected a sample of the wastewater from directly floor cleaner. The floor cleaner was utilized prior to sampling and held in the machine for sampling purposes. PCBs were detected at a concentration of 8.2 parts per billion (ppb). Based upon these levels, floor cleaner wastewater should be handled as PCB containing waste.

Soil

To determine if PCBs from building materials have impacted the soils/gravel surrounding the Site and playground area, ATC collected four (4) samples from areas approximately six to 12 inches from the Site foundation (beneath the roof drip line) and within the playground. Samples were collected from areas outside of Room 108, Room 109, and Room 112, and within the playground. The sample collected adjacent to Room 108 consisted of landscaping gravel. The soil samples outside Rooms 109 and 112 were collected from just below the grass surface. The sample taken from the playground area was collected approximately seven inches below the wood chip surface where the materials transition from wood chips to soil. The playground sample was comprised of a mixture of soil and wood chips. No visual evidence of building sealants were observed at any sampling location.

PCBs not detected above the laboratory's method detection limit for any of the submitted samples. The results indicate that the materials sampled have not been impacted by PCBs.

Indoor Air

ATC performed an initial indoor air sampling monthly from October 2011 through February 2012. Air samples were generally collected over an eight (8) hour period under typical school day conditions (i.e. heat set at approximately 72 degrees and univents running).

Initial sampling was completed October 15, 2011, to evaluate if the sealants identified to contain PCBs present a significant risk to Site occupants via inhalation. Five (5) samples were collected (four classrooms and the cafeteria.) PCBs were detected in the five (5) air samples at concentrations ranging from 0.260 (cafeteria) to 0.75 (Classroom 205) micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The EPA's suggested maximum concentrations of PCBs in school indoor air is $0.100 \mu\text{g}/\text{m}^3$ for kindergarten school children (ages 3 to < 6 years), $0.300 \mu\text{g}/\text{m}^3$ for elementary school children (ages 6 to < 12 years) and $0.450 \mu\text{g}/\text{m}^3$ for adults (19 years or older). Therefore, the PCB concentrations in some of the air samples were above the EPA suggested maximum concentrations of PCBs in school indoor air.

Based on these results, and discussions with the City of Peabody and EPA, interim measures consisting of taping the caulked window frame joint and cleaning of classroom univents were put into place. ATC then collected seven (7) air samples on November, 21, 2011. Sample locations were chosen for spatial coverage and based on room usage (i.e. rooms utilized for kindergarten purposes). PCBs levels declined and were detected at concentrations ranging from 0.090 to $0.370 \mu\text{g}/\text{m}^3$ demonstrating that the interim measures were effective. This sampling event also included a sample from a room where PCB containing sealants had not been identified (guidance office). Windows and exterior doors are not present in this area; the area does include a univent similar to what is in the classrooms. The low results at this location indicate that elevated PCB air concentrations are associated with the presence of PCB containing sealants.

On December 19, 2011, ATC collected an air sample from every classroom and select interior rooms to determine a baseline for the Site interior. PCBs were detected at concentrations ranging from 0.0032 to $0.470 \mu\text{g}/\text{m}^3$. The highest concentrations were observed on the second floor and lowest in rooms where PCB containing sealants were not observed (kitchen) or limited in nature and extent (cafeteria and gymnasium). As shown on Table 4, a correlation between new and old univent motors and elevated PCB in air concentrations was not observed, indicating that the univent motors are not a PCB source.

Sampling completed January 16, 2012, and February 14, 2012 detected PCBs at concentrations ranging from 0.071 to $0.36 \mu\text{g}/\text{m}^3$, which is consistent with the previous air samples collected.

2.5 DATA USABILITY REVIEW

ATC reviewed the laboratory narratives associated with the samples to evaluate the data's usability. This included reviewing detection limits and surrogate recoveries for each sample. This information is shown on Table 3 for bulk and wipe samples. For some samples detection limits were elevated ($> 1 \text{ ppm}$ or $1 \mu\text{g}/100 \text{ cm}^2$). ATC does not believe this impacts data usability since PCBs were observed at concentrations $> 50 \text{ ppm}$ for the samples where QA/QC issues were noted or there are multiple samples with similar results and not all samples had acceptable QA/QC results.

One bulk (IWG-CAFÉ B) was B qualified because PCBs were observed in the laboratory's Method Blank. All other samples in this run were re-analyzed and there was no Method Blank contamination. There was not enough sample to reanalyze IWG-CAFÉ B, so it was qualified. ATC does not believe this impacts data usability since PCBs were reported at 105 ppm in this sample and the Method Blank only had 1.2 ppm PCBs. Following the *Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analysis* validation protocols, based on the fact that the sample analyte concentrations were greater than ten times the laboratory blank analyte concentrations, the presence of the analytes in the laboratory blank is not considered to be significant and does not affect the data usability.

Homologs were reported in the paint PCB homolog analysis the laboratory blank sample, specifically Trichlorobiphenyls and Trichlorobiphenyls and the results for these three samples (PC-110, PC-205 and PC-HW) were therefore B qualified. Contest believed that the elevated concentrations of PCB homologues in the paint samples contaminated the associated laboratory blank sample. Based on the fact that the sample analyte concentrations were greater than ten times the laboratory blank analyte concentrations, the presence of the analytes in the laboratory blank is not considered to be significant and does not affect the data usability. The concentrations of the PCB homologues were between 54 and 392 times the concentrations observed in the laboratory blank.

PCBs homologues were detected in all four (4) of the January 16, 2012 air samples above the laboratory method detection limit. PCB homologues were also detected in the laboratory's quality control Method Blank. The laboratory therefore qualified the data. Three homologues (trichlorobiphenyls, tetrachlorobiphenyls and pentachlorobiphenyls) were detected in the field blank and the laboratory blank sample.

According to Contest, the previously mentioned paint samples and the air samples were prepared as a batch sequentially. Contest believes that the elevated concentrations of PCB homologues in the paint samples contaminated the air samples and associated blank. Contest indicated that this is not a common contaminant for their laboratory and the two batches extracted after these samples did not show PCBs above the laboratory detection limit. Contest also stated that this was an isolated incident related to the elevated levels of PCBs present in the associated paint samples.

ATC referenced the *Region 1, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses* and other data validation guidance to evaluate how the presence of the three homologues in the laboratory method blank impacted data usability. The various guidance referenced state that when an analyte is observed in a method blank and the levels in the associated samples are up to 10 those observed in the method blank, the detected concentrations can be reported as not detected. The three homologues were observed in all three indoor air samples and the field blank at from one to seven times greater concentrations than what was observed in the Method Blank. Therefore, the presence of these homologues on then indoor air samples is questionable.

When evaluating the January 2012 air sampling results in conjunction with all available PCB indoor quality, ATC concludes that the January data set is adequate to set the upper and lower bounds of possible PCB concentrations, but the November and December 2011, and February 2012 results are more representative of actual indoor air PCB concentrations since overall sampling conditions were similar during all three events (November, December and January). Based on the above discussion, ATC believes that the collected data is of suitable quality.

3 NATURE AND EXTENT OF PCBs

This Section summarizes the media containing PCBs and their extent as required by 40 CFR 761.61(a)(3)(i)(A) and 40 CFR 761.61(a)(3)(i)(C). When two or more similar materials were found in similar locations and had similar physical properties the highest PCB concentration observed in any sample associated with the material was assumed to be present in all similar materials. The drawings included in Appendix D show the approximate extent of each material.

The following tables summarize the location, extent and estimated quantities of PCB Bulk Product Waste and PCB Remediation Waste are summarized in the following tables.

PCB BULK PRODUCTS		
Material	Location and Extents	Estimated Quantity
Interior and Exterior Window Surround Frame Caulk	Between CMU or brick (limited area) and metal window frames. Includes all classroom, stairwell, and hallway windows (interior caulk also contains asbestos) Does not include small cafeteria and gymnasium windows	2,100 LF
Interior Window Sill / Univent Rubber Sealant	Between univents and metal window frames in each classroom, entire length of window	700 LF
Interior Window Glazing	At glass and metal window frames in classrooms and large translucent cafeteria/gym windows	9,000 LF
Exterior Door Frame Caulk	Between brick and metal door frames	100 LF

LF = Linear Feet

PCB REMEDIATION WASTES	
Material	Location and Extents
Exterior Window Glazing	At all glass and metal window frames (this material also contains asbestos) – (To be removed)
Interior Window Glazing and Exterior Window Surround Caulk	Small cafeteria/gymnasium windows
Interior Painted CMU	Throughout except where brick is present)portions of the gymnasium, cafeteria, main entrance)
Interior Wooden Window Sills	Small windows within the six corner classrooms (Rooms 101, 108, 109, 116, 201, and 208) (to be removed)
Exterior CMU Window Surround	12 inches from the vertical window frame
Exterior/ Interior Brick Window and Door Surround	Six inches from the vertical window /door frames side door exterior, front door interior and exterior, and small windows (does not include cafeteria or gymnasium windows)
Exterior Poured Concrete Window Sill	Six inches from the vertical window frames (horizontal surface)
Exterior Concrete Thresholds	Six inches from door frames
Univent Metal Surfaces	Within the classroom univents (include blowers and lateral vents)
Interior and Exterior Wood Window Trim	Wood trim in direct contact with window surround caulk (to be removed)
Exterior Metal Siding	Metal siding in direct contact with window surround caulk
Exterior Univent Louvers	At each classroom
Window Sill Flashing	Flashing in direct contact and within 12 inches of window surround caulk

Interim measure related cleaning waste including, univent air filters, vacuum cleaner debris, and floor cleaner waste water is being containerized and treated as a PCB containing Waste. To date, solids have been sent to EQ's Wayne Disposal TSCA landfill in Bellevue, Michigan

4 RISK ASSESSMENT

In accordance with 40 CFR 761.61(c) a human health risk assessment was completed. The purpose of this risk assessment is to evaluate Site exposures and provide a justification for the controls proposed to address these exposures. The assessment is intended to place the Site in the context of its environmental setting and the regulatory categories of environmental media set forth in the CFR. A risk assessment is required because it is ATC's opinion that removal of all PCB Remediation Waste > 1 ppm it is not feasible due to the following reasons:

- All PCB Bulk Product Waste ("source" material) will be removed;
- Based upon surface wipe and indoor air samples data presented herein, current conditions in the majority of the building are within a range considered acceptable based upon TSCA established remediation standards and EPA documents. The proposed abatement is anticipated to improve Site conditions so that surface wipe and indoor air samples from the entire building are all below risk based action levels.
- Impact on building use. The current plan is to complete abatement during the summer while the school is closed. A full abatement program could not be completed during this limited period and would be more disruptive to students.
- Costs associated with extra work. The City does not have funds available to do more than what is currently proposed; and
- The potential risk associated with the short term exposure to workers and building occupants during building wide PCB Remediation Waste removal.

4.1 PCB Source

Identified PCB sources are interior and exterior window frame caulk, exterior door frame caulk, and interior sealant between window and metal univent heaters. These source materials have impacted other building materials and the univents at levels > 1 ppm, as described in Section 3.

4.2 Potential Human Receptors

Human receptors who are likely to be present at the Site and who, as a result, may be exposed to the PCB are students, school employees, and visitors. The current likelihood of humans coming in contact with PCB Bulk Product is considered to be moderate because:

- The material is inaccessible, painted, and/or interim measures put into place limit the exposure of caulk.
- Surface wipe samples show that direct contact with PCB impacted materials does not provide a significant transfer pathway.
- PCBs have been observed within indoor air but generally within ranges identified by the EPA as prudent public health levels.

4.3 Potential Exposure Points, Pathways and Controls

Potential human exposure points are direct contact with (touching or ingesting PCB containing materials) or indirect contact (inhalation of PCBs that might be in air). The potential human exposure pathways are dermal absorption, ingestion, inhalation of PCB.

The exposure to all PCB Bulk Product wastes will be controlled by its removal from the Site.

The exposure to the following PCB Remediation Wastes will be eliminated by their removal from the Site:

- Exterior window glazing compound;
- Interior wooden window sills in rooms 101, 108, 109, 116, 201, and 208;
- Interior and exterior wood trim in direct contact with window surround caulk;
- Exterior metal siding in direct contact with a window surround caulk;
- Filters and insulation associated with univents;
- Exterior univent louvers; and
- Interior window glazing compound and exterior window surround caulk at small gymnasium and cafeteria windows.

The exposure to the following PCB Remediation Wastes will be eliminated by their decontamination:

- Concrete door thresholds to 6 inches from door surround caulk;
- Univent metal case and vents;
- Brick surround in direct contact with window surround caulk; and
- Sill flashing in direct contact and within one foot of window caulk;

The exposure to the following PCB Remediation Wastes will be controlled by encapsulation:

- Exterior poured concrete window sills; and
- Interior and exterior painted CMU surrounds and interior poured concrete surfaces (within one foot of window caulk);

The exterior concrete sills will be covered with metal flashing eliminating the dermal and ingestion pathway. Outdoor air sampling has demonstrated that under existing conditions that PCB from the building materials are not detected, and therefore, the inhalation pathway is not present outside the Site.

All exposure pathways to painted CMU within one foot of window caulk will be controlled by applying an encapsulant. This will eliminate the dermal and ingestion pathway. Indoor air monitoring will be performed to confirm that the inhalation pathway is not significant.

There currently is not a dermal or ingestion exposure pathway associated with the painted interior CMU beyond the area proposed for encapsulation. This is based on the current surface wipe sampling results and observed paint condition. A long term maintenance program will address the painted CMU surfaces. Post abatement indoor air monitoring will be utilized to confirm that the painted surfaces are not a significant PCB source to indoor air.

The removal, decontamination, and encapsulant systems will be shown to be performing adequately to manage residual PCBs if future surface wipe samples of accessible painted CMU, encapsulated painted CMU, and decontaminated surfaces have a concentrations no greater than 1 $\mu\text{g}/100\text{ cm}^2$ for porous surfaces (e.g. CMU) or 10 $\mu\text{g}/100\text{ cm}^2$ for non-porous surfaces (e.g. metal) and indoor air levels are below the EPA's public health target of 0.100 $\mu\text{g}/\text{m}^3$ value for kindergarten age children. If these values are exceeded, additional evaluations will be performed

to determine if these levels present an actual risk to building users and if additional PCB abatement activities are required. Refer to Section 5.2 for additional information.

5 RISK-BASED CLEANUP PLAN

This Section details the cleanup plan, as required by 40 CFR 761.61(a)(3)(i)(D). The PCB abatement work is a part of the MSBA sustainable Green Repair Program window replacement project. The associated Technical Specifications from this program related to PCB abatement activities are included in Appendix C and are also included in the Bid Documents provided to firms bidding the window replacement and associated PCB abatement project. When there is a conflict between the information between the Request and Technical Specifications, the Request requirements shall prevail. The sections below and Appendix C provide details on the proposed remediation work. It is important to note that asbestos abatement will occur in conjunction with PCB abatement that will bring its own worker safety, and dust and waste management controls to the project.

The primary components of the risk-based cleanup plan as detailed in the Technical Specifications are:

- 1) Remove window and door systems and associated PCB Bulk Product Waste (window and door surround sealants, and interior sealant between window and metal heater) throughout the Site. All materials will be managed as > 50 ppm PCB unless PCB and asbestos containing sealants are fully removed from non-porous materials (metal and glass) and the non-porous materials are decontaminated in accordance with 40 CFR 761.61(a)(5)(ii).
- 2) Remove the following PCB Remediation Waste as required to install new window and/or door systems and manage as containing > 50 ppm PCB. Non-porous (metal and glass) materials may be decontaminated in accordance with 40 CFR 761.61(a)(5)(ii):
 - a. Interior wooden window sills in rooms 101, 108, 109, 116, 201 and 208;
 - b. Interior and exterior wood trim in direct contact with window surround caulk;
 - c. Exterior univent louvers;
 - d. Filters and insulation associated with univents; and
 - e. Sill flashing in direct contact and within one foot of window caulk.
- 3) All remaining surfaces where PCB containing sealants are removed will be cleaned using HEPA vacuums and then double wiped with hexane (or other acceptable solvent) wetted cloths if not removed. This includes:
 - a. Window and door surround masonry surfaces (CMU and poured concrete) within one foot of surround caulk on the interior and exterior side;
 - b. Window and door brick surround within 6-inches from the window or door surround caulk except for cafeteria and gymnasium;
 - c. Exterior poured concrete window sills;
 - d. Exterior metal siding in direct contact with a window surround caulk;
 - e. Doors that are to be reinstalled;
 - f. Outside the univent metal case and lateral vents.
 - g. All internal accessible portions of univent shall be cleaned so as to remove all visible oil, grease, grime and dust. All interior exterior metal surfaces

- shall be cleaned, this includes interior of lateral vents that emanate from univent system;
 - h. Removed cabinet system surfaces prior to reinstallation; and
 - i. Sill flashing in direct contact and within one foot of window caulk.
- 4) An encapsulant will be applied to the painted CMU and interior poured concrete surfaces (if present) to one foot of either side of window surround caulk (interior and exterior). It shall consist of an at least two layer coating system. After removal of PCB Bulk Product prepare surface by removing loose paint and debris. If power tools will be used to prepare surface or there is the potential to generate dust, work shall occur in containment. If washing is required, additional measures will be taken for washwater.
- 5) Exterior window sill flashing will extend over entire concrete poured sill to serve as the concrete sill encapsulant.
- 6) Managing all wastes generated in accordance with 40 CFR 761 and 310 CMR 30.000.

Due to the fact that some of the PCB containing building materials and other materials contain asbestos, the contractor will submit the Asbestos Notification Form ANF-001 and Notification Prior to Construction or Demolition Form BWP AQ-06 to the Massachusetts Department of Environmental Protection (MassDEP) when impacting asbestos-containing materials. In addition, the work at these locations shall be performed in accordance with the procedures outlined in this document as well as federal Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101 Regulations, Massachusetts Department of Labor and Industry (DLWD) 453 CMR 6.0 Regulations, and MassDEP 310 CMR 7.15 Regulations.

ATC believes that the work plan outlined in this submittal is adequate to properly manage PCB Bulk Product Waste and PCB Remediation Waste, and control future exposures to residual PCBs in concrete at the Site.

5.1 ASSIGNMENT OF WORK

Cleanup activities will be performed by a qualified contractor contracted by the City of Peabody. The contractor will be provided with this Request and Specifications, any forthcoming approvals and conditions issued by the EPA. The contractor will be required to provide written certification that they understand and will comply with both documents.

The contractor will perform the project work in a manner to meet or exceed the means and methods presented in this Request. The contractor will provide a work plan to the City of Peabody prior to the beginning of abatement activities for acceptance. The workplan will be forwarded to EPA upon the City of Peabody's approval.

Third-party environmental oversight and review of the cleanup plan activities prior to, during, and after their performance will be performed by ATC. ATC will monitor compliance with this Request, visually confirm that identified sealants, masonry, and duct work are removed, and collect confirmatory samples.

5.2 PROCEDURES FOR IMPLEMENTATION

Each of the primary components of the risk-based cleanup plan is detailed in the following subsections. The components will be performed generally in the order in which they are listed. Refer to the attached Specifications for additional details (Appendix C).

5.2.1 Communication Plan

The Site is currently occupied, but will be vacant and not be accessible to the general public during the abatement work. The contractor will secure and post the work area prior to starting work. Appropriate City of Peabody staff will be briefed on the project scope prior to the initiation of PCB abatement/encapsulation activities at the Site.

The City of Peabody has established a website, conducted public meetings to provide information related to PCBs in at the Site and established an advisory committee comprised of parents and staff. The website can be found at the following link: <http://216.20.5.151/health&safety/pcbs.htm>. The proposed work as it relates to PCB abatement at the Site will be reviewed during advisory committee meeting(s).

5.2.2 Post-Abatement Confirmatory Sampling

The effectiveness of the PCB abatement program will be confirmed by a post-abatement confirmatory sampling program. The initial part of this program will be the visual confirmation that all window/door units and associated surround caulk have been removed and surfaces cleaned as detailed above. Confirmatory surface wipe, bulk and indoor air sampling will then be performed to determine if abatement goals have been achieved as discussed below. The results of this initial sampling program will also be used to determine if additional work is required to address interior painted CMU surfaces that are not encapsulated.

5.2.2.1 Post-Remediation Confirmatory Wipe and Bulk Sampling

To confirm that applied encapsulants are performing and non-porous surface decontamination has been effective, surface wipe samples will be collected per standard wipe test protocols in accordance with 40 CFR 761.123. Samples will be collected utilizing the applicable procedures identified in Wipe Sampling and Double Wash/Rinse Cleanup as recommended by the EPA PCB Spill Cleanup Policy (June 23, 1987, Revised and Clarified on April 18, 1991). A one-use template will be used to delineate the 100 cm² sampling area. The samples will be analyzed at a certified laboratory for PCBs via EPA Method 8082 and extracted via EPA Method 3540C.

To confirm encapsulant performance surface wipe sampling of the applied encapsulated surfaces at areas that would be accessible to building users will be performed as follows:

- From eight (8) classroom interiors. Samples will be collected from encapsulated CMU locations immediately adjacent to (within six inches of the edge) where PCB Bulk Product Waste was removed; and
- One (1) exterior encapsulated CMU sample from each side of the building for a total of four (4) samples.

If any confirmatory surface wipe samples indicate a PCB concentration greater than 1 µg/100 cm², the City of Peabody will undertake an expanded wipe sampling program. This expanded program may include sampling with an alternate wetting agent to further

evaluate the ability for PCBs to transfer via direct human contact. The objective of the expanded wipe sampling program would be to confirm that PCB concentrations do not exceed $1 \mu\text{g}/100 \text{ cm}^2$. Following the receipt of results from the expanded wipe sampling program, the City of Peabody will evaluate extent of exceedances.

Depending upon the extent of the exceedance, and with input from the EPA, the City of Peabody may prepare a more detailed site specific risk assessment to determine if the results represent a significant risk and if the $1 \mu\text{g}/100 \text{ cm}^2$ action level is appropriate or if re-coating and sampling is appropriate.

To confirm that non-porous surfaces have been adequately decontaminated; surface wipe samples will be collected as follows:

- From accessible exterior surfaces of eight (8) univents within classrooms;
- From interior surface of eight (8) univents; and
- Up to three (3) from metal sill flashing, if present. Depending upon installation approach, this material may be removed and managed as PCB Remediation Waste.

If any confirmatory surface wipe sample indicates a PCB concentration greater than $1 \mu\text{g}/100 \text{ cm}^2$, the location will be reviewed to determine if the $10 \mu\text{g}/100 \text{ cm}^2$ action level identified in TSCA for non-porous surfaces is appropriate. This will include evaluating the accessibility of the area and the results of other post abatement sampling results. Based upon this review the City of Peabody will determine if an expanded wipe sampling program should be performed. This sampling may include utilizing an alternate wetting agent to further evaluate the ability for PCBs to transfer via direct human contact. The objective of the expanded wipe sampling program would be to evaluate the extent of surfaces exceeding the 1 or $10 \mu\text{g}/100 \text{ cm}^2$ PCB levels.

Depending upon the extent of the exceedance, and with input from the EPA, the City of Peabody may prepare a more detailed site specific risk assessment to determine if the results represent a significant risk and if the 1 or $10 \mu\text{g}/100 \text{ cm}^2$ action level is appropriate or if additional decontamination efforts are warranted.

For all wipe sampling efforts, one trip blank and one sample duplicate will be collected for every twenty (20) samples collected.

To evaluate the effectiveness of decontaminating doorway concrete thresholds and brick window/door surrounds bulk (masonry) samples will be collected as follows utilizing procedures presented in the EPA Standard Operation Procedure for Sampling Porous Surfaces (May 5, 2011):

- Concrete door exterior thresholds 6 inches from door surround caulk: One (1) sample from within 6 inches of each threshold for a total of nine (9) samples.
- Brick surround in direct contact with window surround caulk: One (1) sample from within 6 inches of each window/door surround from the four interior and thirteen exterior locations where PCB Remediation Waste defined caulk was removed for a total of seventeen (17) samples.

If any of the confirmatory bulk samples indicates a PCB concentration greater than 1 ppm, additional decontamination will be performed and the area resampled or the area will be encapsulated with either metal or similar non-porous material or coated with a sealant.

5.2.2.2 Post-Remediation Confirmatory Indoor Air Sampling

Following completion of the renovation project, post-remedial indoor air samples will be collected from all classrooms, the cafeteria, gymnasium, guidance office, and second floor hallway. An ambient air sample and field blank will also be collected, for a total of thirty-one (31) samples. The sampling procedures and locations will mimic those outlined in Section 2.3.

Data will be reviewed to confirm that the anticipated reduction in PCB levels is present. The ultimate goal is to demonstrate that average indoor air PCB concentrations are below the $0.100 \mu\text{g}/\text{m}^3$ value published by the EPA as a prudent public health level for kindergarten age children. If levels have not dropped from pre-abatement levels, further investigations will be performed to determine if there are other PCB sources within the school and the benefit of encapsulating all the interior CMU painted surfaces will be reviewed.

5.2.3 Long Term Monitoring and Maintenance

A Long-Term Monitoring and Maintenance Implementation Plan (MMIP) will be submitted to the EPA after remediation has occurred and initial post-remediation data reviewed. The results of encapsulation, post-remediation confirmatory sampling and indoor air sampling will be considered when developing the MMIP. The MMIP will:

- Establish requirements for optimizing HVAC system fresh air exchanges;
- Present procedures for visual inspections, surface wipe sampling and indoor air sampling;
- Establish procedures for handling PCB Remediation Waste building components that might remain after completing the work detailed in this Request; and
- Establish housekeeping practices to continue to minimize potential disturbance of remaining PCB containing materials.

It is currently anticipated that, beginning six months following the confirmatory wipe sampling, the City of Peabody will perform semi-annual inspections of encapsulated surfaces, with a focus on those areas that would be directly accessible to building occupants. The inspections will be visual and will be intended to confirm that the encapsulated surface is in good condition. The inspector will visually observe all encapsulated surfaces for evidence of deterioration of the encapsulant, including wear, chipping, or flaking, missing or damaged engineered material. They will specifically look to see if the contrasting color base coat encapsulant is visible. Inspections, and any necessary repairs to the encapsulated surface, will be documented and inspection reports maintained by the City of Peabody for the life of the building.

Semi-annual surface wipe sampling of the univent exteriors, encapsulated CMU surfaces (interior and exterior), and painted interior CMU surfaces that were not coated during the

renovations will be performed. Samples will be collected from areas accessible to building users. Four (4) samples from each of the above areas will be collected, for a total of sixteen (16) wipe samples per sampling event. In addition, a trip blank and duplicate sample will be submitted for analysis.

If any of the confirmatory surface wipe samples indicates a PCB concentration greater than $1 \mu\text{g}/100 \text{ cm}^2$, the City of Peabody will undertake an expanded wipe sampling program. This expanded program may include sampling with an alternate wetting agent to further evaluate the ability for PCBs to transfer via direct human contact. The objective of the expanded wipe sampling program would be to confirm that PCB concentrations do not exceed $1 \mu\text{g}/100 \text{ cm}^2$ and for non-porous surfaces (metal univents) if the value exceeds $10 \mu\text{g}/100 \text{ cm}^2$. Following the receipt of results from the expanded wipe sampling program, the City of Peabody will evaluate extent of exceedances.

Depending upon the extent of the exceedance, and with input from the EPA, the City of Peabody may prepare a more detailed site specific risk assessment to determine if there is a significant risk and the $1 \mu\text{g}/100 \text{ cm}^2$ action level is appropriate or if re-coating or decontamination and sampling is appropriate.

Indoor sampling will initially be performed on a quarterly basis so that samples are collected during each season (winter, spring, summer, and fall). It is currently assumed that six (6) class rooms will be sampled (four classrooms on the first floor and two classrooms on the second floor) along with a trip blank. The actual sampling program will be developed based upon the results of the confirmatory sampling program. Assuming that the $0.100 \mu\text{g}/\text{m}^3$ goal has been achieved, the sampling program would be reduced to semi-annually after one year.

To confirm that the cleaning byproducts (univent air filters, vacuum debris, and floor cleaner wastewater) are not adversely impacted by PCBs, each media will be sampled three times following PCB abatement. If results of bulk (solid) analysis are all $< 1 \text{ ppm}$ and wastewater $< 0.3 \text{ ppb}$, the materials will be managed as general waste. If levels are elevated, the materials will continue to be managed as a PCB containing material.

The overall sampling program will be reviewed, and if remediation goals routinely met, the number and/or frequency for samples may be reduced, with EPA concurrence.

The inspection results and sampling data will be submitted to the EPA along with any modifications to the inspection or sampling program.

5.2.4 Deed Notice

The City of Peabody will record a deed notice for the Site after completion of PCB remedial activities. The deed notice will follow the TSCA requirements outlined at 40 CFR 761.61(a)(8), and will inform any potential future purchaser of the Site that:

- 1) Where PCB Remediation Waste and other PCB containing materials remain;
- 2) On-going sampling and monitoring of conditions related to residual PCBs at the Site are required;

- 3) Implementation of standard operation procedures (SOPs) which are required for certain activities taking place at the Site; and
- 4) Proper removal and disposal of remaining PCB-impacted materials is required upon demolition of all or portions of the Site.

Following recording of the deed notice, a copy, along with certification that the deed notice has been recorded with the registry of deeds, will be provided to the EPA.

5.3 Waste Management

All waste management will be in accordance with applicable state and federal regulations. This includes 40 CFR 761.61 or 761.62 and sent to a licensed facility that will receive and retain PCB Bulk Product Waste and PCB Remediation Waste, in accordance with EPA regulations. Details on waste management are provided in the Technical Specification in Appendix C.

The types of waste that will be generated include:

- 1) PCB-containing caulking (PCB Bulk Product Waste) (PCBs > 50 ppm);
- 2) Window/door units (managed as containing > 50 ppm of PCBs);
- 3) Abutting building materials (managed as containing > 1 ppm of PCBs);
- 4) Cleaning by products (managed as containing > 1 ppm of PCBs);
- 5) Particulates and filters from dust management; and
- 6) PPE and containment materials.

PCB-containing caulk will be containerized and labeled as “PCB Bulk Product Waste” for disposal; this includes window/door units, filters, particulates, PPE and equipment that cannot be fully decontaminated, as well as dust/debris collected from established PCB removal work areas.

PCB waste containers will be placed in a secure portion of the Site. This area will be approved by the City of Peabody and will be placarded as containing PCB waste with markings meeting the EPA requirements of 40 CFR 761.40 and 761.45, and 310 CMR 30.000.

PPE and containment materials that has debris which might contain PCBs, will be classified as PCB Remediation Waste, properly containerized and managed in accordance with 761.61(a)(5). The container(s) will be labeled per 40 CFR 761.61 and 761.79. Once full, the container(s) will be transported off-site for proper disposal.

Due to their asbestos content, interior window frame caulk and exterior window glazing associated with the proposed window/door replacement activities will be double bagged, containerized to also meet asbestos management requirements.

As discussed previously, the contractor has the option of managing the entire window/door units and surround caulk as PCB Bulk Product Waste, or disassembling the units, separating the sealants from the metal and glass, and decontaminated the metal and glass. If this second option is taken, the glazing will be managed as PCB Bulk Product Waste, the surround sealant as PCB Remediation ≥ 50 ppm and the metal and glass as demolition debris.

If MassDEP is provided and waste material is transported to a non-hazardous waste landfill that is allowed to accept the material, a Uniform Hazardous Waste Manifest is not required.

A fence with proper signage will be constructed around the waste storage area to further restrict access. Copies of all bills of landing, waste shipment records, and certificates of disposal will be provided as proof of proper disposal.

5.4 SCHEDULE FOR IMPLEMENTATION

In accordance with the TSCA regulations at 40 CFR 761.61(a)(3), implementation of the plan outlined in this Request is anticipated to start June 2012, contingent upon approval by the U.S. EPA - Region 1 PCB coordinator. The City of Peabody estimates that the work outlined in Sections 5.2.1 through 5.2.4 of this Request will take approximately three (3) months.

5.5 STATE OR LOCAL PERMITS AND APPROVALS

State and/or local permits and/or inspections will not be necessary during implementation of the cleanup plan. With the exception of the building permit for general construction, MassDEP notifications for abating asbestos (ANF-001), and building construction (BWP AQ-06). The MassDEP and the City of Peabody Health Department have been copied on this Request.

April 23, 2012

6 OWNER CERTIFICATION

This Section of the Notification provides the certification required by 40 CFR 761.61(a)(3)(i)(E).

I certify that the Risk-Based Cleanup Plan proposed in this document will meet the following requirements:

All sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site are or will be on file at the following location and are available for U.S. EPA inspection:

David Keniston
School Business Manager
City of Peabody
21 Johnson Street
Peabody, Massachusetts 01960
Telephone: (978) 536-6520
kenistond@peabody.k12.ma.us

David C Keniston
Name (Printed)

[Signature]
Signature

Business Manager
Title

4/25/12
Date

Figures

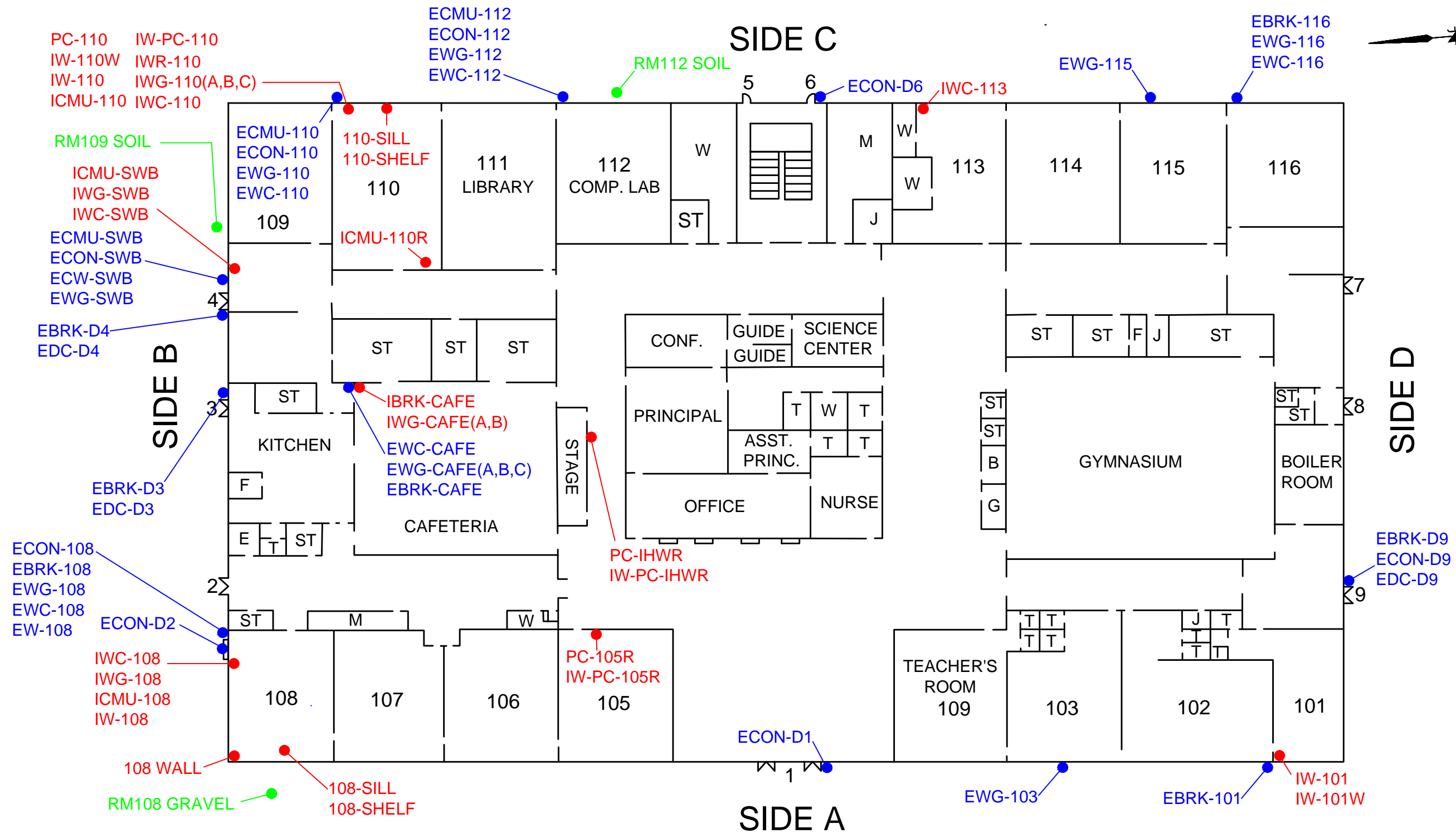


Figure 1 - Site Vicinity Map

Source:
 United States Geological Survey
 Reading, Massachusetts Orthophotomap
 Scale: 1:24,000
 (2009)



**Request for Approval of TSCA Risk-Based
 Cleanup of PCBs under 40 CFR 761**
 Burke Elementary School
 127 Birch Street
 Peabody, Massachusetts 01960



600 West Cummings Park, Suite 5450
Woburn, Massachusetts 01801
Tel.(781)932-9400 Fax.(781)932-6211

PCB SAMPLE LOCATIONS FIRST FLOOR

BURKE ELEMENTARY SCHOOL
127 BIRCH STREET
PEABODY, MASSACHUSETTS

PROJECT NUMBER:

060.41546.0006

SCALE:

NOT TO SCALE

FILE:

BURKE SCHOOL PLANS 3-13-12

FIGURE NUMBER:

2

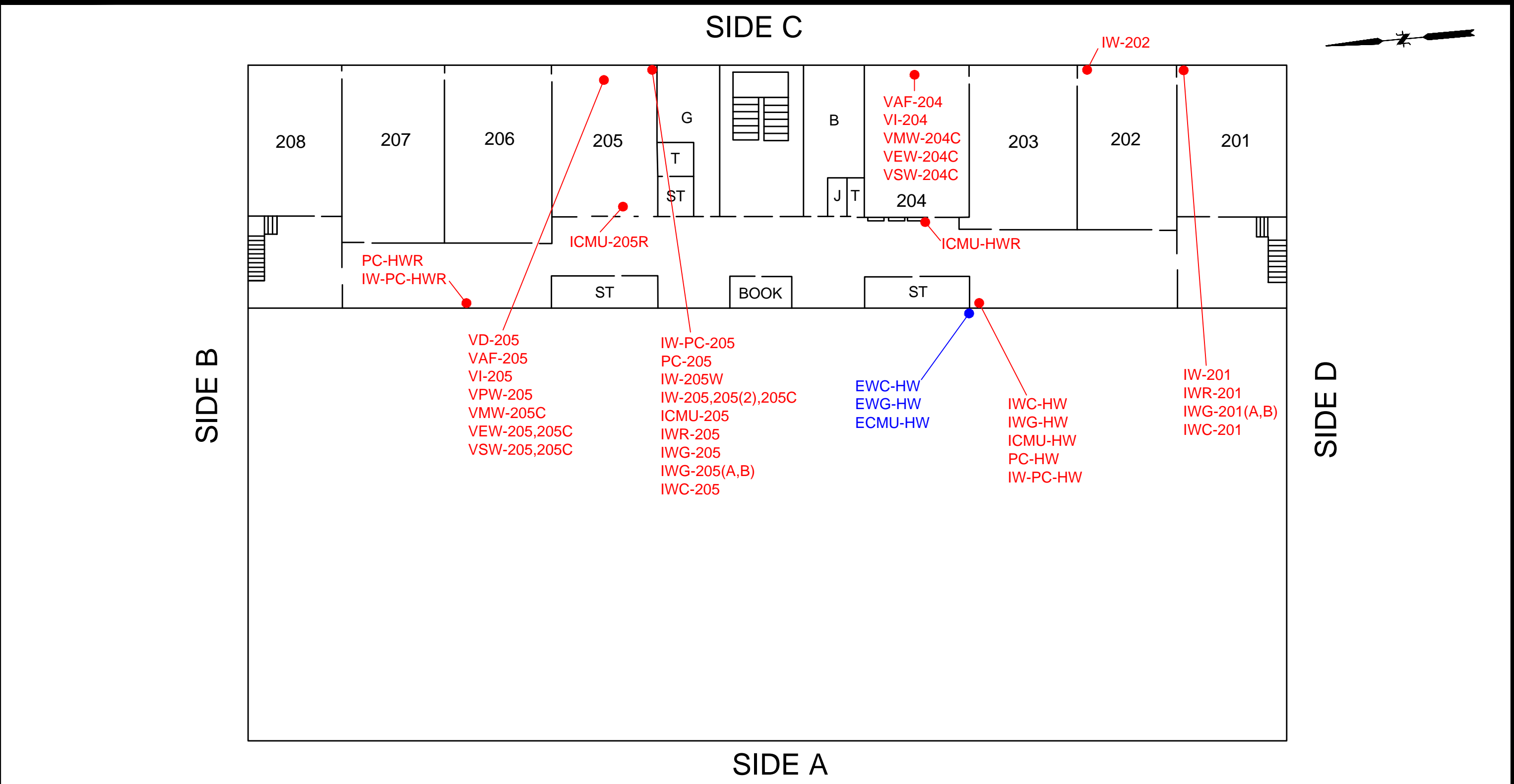
DATE:

MARCH 15, 2012

DRAWN BY: JB

REVISED BY: CA

CHECKED BY: MG



600 West Cummings Park, Suite 5450
Woburn, Massachusetts 01801
Tel.(781)932-9400 Fax.(781)932-6211

LEGEND

- IWC-108 = INTERIOR SAMPLES
- ECON-108 = EXTERIOR SAMPLES
- RM109 SOIL = SOIL SAMPLES

**PCB SAMPLE LOCATIONS
SECOND FLOOR**

BURKE ELEMENTARY SCHOOL
127 BIRCH STREET
PEABODY, MASSACHUSETTS

PROJECT NUMBER:
060.41546.0006

SCALE:
NOT TO SCALE

FILE:
BURKE SCHOOL PLANS 3-13-12

FIGURE NUMBER:
3

DATE:
MARCH 15, 2012

DRAWN BY: JB
REVISED BY: CA
CHECKED BY: MG

Table 1 - PCB Sampling Summary
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample Date	Sample Media	Sample Locations	Total Samples Analyzed*	Sampling Rationale
5/6/11	Interior and exterior window frame caulk and glazing	Classrooms	4	Initial semi-quantitative window sealant survey performed by Covino.
10/15/11	Interior metal window sill/shelf/wall wipes	Classrooms	5	Determine if materials adjacent to windows have been impacted by PCBs/potential for transfer by direct contact.
	Indoor air	Classrooms and cafeteria	5	Determine air PCB concentrations.
11/21/11	Indoor air	Classrooms and guidance office	10	Determine air PCB concentrations. Effectiveness of initial interim measures
12/10/11	Interior and exterior window frame caulk and glazing	Classrooms, stairwells, hallways, cafeteria	40	Determine extents of PCB-containing window sealants throughout building.
	Interior and exterior CMU/brick window surround	Classrooms, stairwells, hallways, cafeteria	32	Determine if materials adjacent to windows have been impacted by PCBs.
	Interior and exterior metal window sill wipes	Classrooms	4	Determine if materials adjacent to windows have been impacted by PCBs.
12/19/11	Univent wipes and interior debris	Classrooms	4	Determine if interior of univent materials have been impacted by PCBs.
	Indoor air	Classrooms, cafeteria, gym, kitchen, and outdoors	31	Determine air PCB concentrations.
12/27/11	Interior CMU window surround and random area samples	Classrooms, stairwells, hallways	8	Determine if materials adjacent to windows and random area have been impacted by PCBs.
	Interior metal window sill/shelf/wall wipes	Classrooms	8	Determine if materials adjacent to windows have been impacted by PCBs.
1/11/12	Soil	Adjacent to school and playground	4	Determine if soil adjacent to building and in playground area has been impacted by PCBs
1/16/12	Exterior CMU/concrete/brick window surround	Classrooms	8	Determine if materials adjacent to windows have been impacted by PCBs.
	Exterior CMU/concrete/brick door surround	Doorways	11	Determine if materials adjacent to doors have been impacted by PCBs.
	Univent wipes, air filters, and insulation	Classrooms	10	Determine if interior of univent materials have been impacted by PCBs.
	Vacuum cleaning debris	Vacuums	2	Determine if cleaning debris containPCBs.
	Paint	Classrooms and hallways	3	Determine paint PCB concentrations
	Indoor air	Classrooms	4	Monitor PCB indoor air concentration.
1/20/12	Exterior door frame caulk	Doorways	3	Determine if door frame sealants contain PCBs.
2/14/12	Paint wipes	Classrooms and hallways	6	Determine if painted CMU walls contain or have been impacted by PCBs
	Paint	Classrooms and hallways	3	Determine if paint contains PCBs.
	Floor cleaner waste water	Floor cleaner	1	Determine if cleaning waste water contains PCBs.
	Indoor air	Classrooms	6	Monitor PCB indoor air concentration.

Notes
* = Includes field blank and duplicate samples

PCBs in Building Materials Evaluation Burke Elementary School 127 Birch Street Peabody, Massachusetts						
Sample ID	Material	Sample Location	Material Location	PCB Concentration (ppm; unless noted)	Sample Date	Notes
Interior Sealant Samples						
Interior Window Frame Caulk						
Interior Window Caulk	Interior window frame caulk	Composite (collected by Covino)	Classrooms	43,600	5/6/11	Material is located throughout all classrooms, stairwells, and hallways
IWC-108	Interior window frame caulk (gray)	Room 108	6 Corner classrooms	87,000	12/10/11	
IWC-110	Interior window frame caulk (gray)	Room 110	Classrooms	65,000	12/10/11	
IWC-201	Interior window frame caulk (gray)	Room 201	Classrooms	76,000	12/10/11	
IWC-205	Interior window frame caulk (gray)	Room 205	Classrooms	70,000	12/10/11	
IWC-SWB	Interior window frame caulk (gray)	Stairwell B	4 Stairwells	76,000	12/10/11	
IWC-HW	Interior window frame caulk (gray)	Hallway (second floor)	Hallways	67,000	12/10/11	
Interior Window Glazing						
IWG-110 A	Interior window frame glazing (gray)	Room 110	Classrooms	117	12/10/11	Material is located throughout all classrooms and stairwells
IWG-201 A	Interior window frame glazing (gray)	Room 201	Classrooms	290	12/10/11	
IWG-205 A	Interior window frame glazing (gray)	Room 205	Classrooms	148	12/10/11	
IWG-SWB	Interior window frame glazing (gray)	Stairwell B	4 Stairwells	117	12/10/11	
IWG-108	Interior window frame glazing (black)	Room 108	6 Corner classrooms	110	12/10/11	Material is located throughout all classrooms, hallways, cafeteria and gymnasium
IWG-110 B	Interior window frame glazing (black)	Room 110	Classrooms	86	12/10/11	
IWG-201 B	Interior window frame glazing (black)	Room 201	Classrooms	360	12/10/11	
IWG-205 B	Interior window frame glazing (black)	Room 205	Classrooms	139	12/10/11	
IWG-HW	Interior window frame glazing (black)	Hallway (second floor)	Hallways	241	12/10/11	
IWG-CAFE B	Interior window frame glazing (black)	Cafeteria (translucent windows)	Cafeteria-Gym/translucent	105 (B)	12/10/11	
Interior Isolated Window Sealants						
IWC-113	Interior window frame caulk at Univent (white)	Room 113	Room 113 only	31.5	12/10/11	Materials are located only in the areas listed
IWG-110 C	Interior window frame glazing (white)	Room 110	Room 110 only	31	12/10/11	
IWG-CAFE A	Interior window frame glazing (clear)	Cafeteria	Cafeteria-Gym/small windows	23	12/10/11	
Interior Window Sill at Univent Rubber Sealant						
IWR-110	Interior window sill rubber sealant at Univent (gray)	Room 110	Classrooms	17,000	12/10/11	Material are located throughout all classrooms
IWR-201	Interior window sill rubber sealant at Univent (gray)	Room 201	Classrooms	31,700	12/10/11	
IWR-205	Interior window sill rubber sealant at Univent (gray)	Room 205	Classrooms	6,000	12/10/11	
Interior Window Glazing Sample Collected by Covino Environmental Associates						
Interior Window Glazing Compound	Interior window frame glazing	Composite	Classrooms	38.1	5/6/11	Not considered a representative sample
Exterior Sealant Samples						
Exterior Window Frame Caulk						
Exterior Window Caulk	Exterior window frame caulk	Composite (collected by Covino)	Classrooms	54,400	5/6/11	Material is located throughout the exterior of all classrooms, stairwells, and hallways
EW-108	Exterior window frame caulk (gray)	Room 108	6 Corner classrooms	129,000	12/10/11	
EW-110	Exterior window frame caulk (gray)	Room 110	Classrooms	124,000	12/10/11	
EW-112	Exterior window frame caulk (gray)	Room 112	Classrooms	128,000	12/10/11	
EW-116	Exterior window frame caulk (gray)	Room 116	Classrooms	122,000	12/10/11	
EW-SWB	Exterior window frame caulk (gray)	Stairwell B	4 Stairwells	99,000	12/10/11	
EW-HW	Exterior window frame caulk (gray)	Hallway (second floor)	Hallways	137,000	12/10/11	
Exterior Window Glazing						
EWG-108	Exterior window frame glazing (white)	Room 108	6 Corner classrooms	7.5	12/10/11	Material is located throughout the exterior of all classrooms
EWG-110	Exterior window frame glazing (white)	Room 110	Classrooms	26	12/10/11	
EWG-112	Exterior window frame glazing (white)	Room 112	Classrooms	3.2	12/10/11	
EWG-116	Exterior window frame glazing (white)	Room 116	Classrooms	5.8	12/10/11	
Exterior Isolated Window Sealants						
EW-CAFE	Exterior window frame caulk (gray)	Cafeteria	Cafeteria-Gym/small windows	4.7	12/10/11	Materials are located only in the areas listed
EWG-SWB	Exterior window frame glazing (gray)	Stairwell B	4 Stairwells	8.1	12/10/11	
EWG-HW	Exterior window frame glazing (gray)	Hallway (second floor)	Hallways	154	12/10/11	
EWG-CAFE A	Exterior window frame glazing (gray)	Cafeteria	Cafeteria-Gym/small windows	ND (1.0)	12/10/11	
EWG-CAFE B	Exterior window frame glazing (white)	Cafeteria	Cafeteria-Gym/small windows	ND (1.0)	12/10/11	
EWG-CAFE C	Exterior window frame glazing (black)	Cafeteria-translucent windows	Cafeteria-Gym/translucent windows	ND (10)	12/10/11	
EWG-103	Exterior window frame glazing (gray)	Room 103	Room 103 only	2.5	12/10/11	
EWG-115	Exterior window frame glazing (black)	Room 115	Room 115 only	ND (0.97)	12/10/11	
Exterior Window Sealant Samples Collected by Covino Environmental Associates						
Exterior Window Glazing Compound	Exterior window frame glazing	Composite	Classrooms	2.7	5/6/11	Not considered a representative sample
Exterior Door Frame Caulk						
EDC-D3	Exterior door frame caulk (gray)	Door 3	Side B&D Doors	79,000	1/20/12	No interior surround caulk
EDC-D4	Exterior door frame caulk (gray)	Door 4	Side B&D Doors	110,000	1/20/12	
EDC-D9	Exterior door frame caulk (gray)	Door 9	Side B&D Doors	73,000	1/20/12	
Interior Building Material Samples						
Interior Brick Surround						
IBRK-CAFE Adj	Interior brick window surround (adjacent to frame)	Cafeteria	Cafeteria- Gym/small windows	ND (0.095)	12/10/11	No interior surround caulk
IBRK-CAFE 12"	Interior brick window surround (12" from frame)	Cafeteria	Cafeteria- Gym/small windows	ND (0.091)	12/10/11	
Interior CMU Surround						
ICMU-108 Adj	Interior painted CMU window surround (adjacent to caulk joint)	Room 108	6 Corner classrooms	370	12/10/11	96.6 ppm paint homolog
ICMU-108 12"	Interior painted CMU window surround (12" from caulk joint)	Room 108	6 Corner classrooms	4.1	12/10/11	
ICMU-108 2'	Interior painted CMU window surround (2' from caulk joint)	Room 108	6 Corner classrooms	2.9	12/27/11	
ICMU-110 Adj	Interior painted CMU window surround (adjacent to caulk joint)	Room 110	Classrooms	200	12/10/11	
ICMU-110 12"	Interior painted CMU window surround (12" from caulk joint)	Room 110	Classrooms	42	12/10/11	
ICMU-110 2'	Interior painted CMU window surround (2' from caulk joint)	Room 110	Classrooms	6.2	12/27/11	
ICMU-205 Adj	Interior painted CMU window surround (adjacent to caulk joint)	Room 205	Classrooms	24	12/10/11	142 ppm paint homolog
ICMU-205 12"	Interior painted CMU window surround (12" from caulk joint)	Room 205	Classrooms	9.8	12/10/11	
ICMU-205 2'	Interior painted CMU window surround (2' from caulk joint)	Room 205	Classrooms	12.9	12/27/11	
ICMU-SWB Adj	Interior painted CMU window surround (adjacent to caulk joint)	Stairwell B	4 Stairwells	320	12/10/11	35.0 ppm homolog
ICMU-SWB 12"	Interior painted CMU window surround (12" from caulk joint)	Stairwell B	4 Stairwells	1.65	12/10/11	
ICMU-SWB 2'	Interior painted CMU window surround (2' from caulk joint)	Stairwell B	4 Stairwells	4.3	12/27/11	
ICMU-HW Adj	Interior painted CMU window surround (adjacent to caulk joint)	Hallway (second floor)	Hallways	101	12/10/11	35.0 ppm homolog
ICMU-HW 12"	Interior painted CMU window surround (12" from caulk joint)	Hallway (second floor)	Hallways	5	12/10/11	
ICMU-HW 2'	Interior painted CMU window surround (2' from caulk joint)	Hallway (second floor)	Hallways	1.5	12/27/11	
ICMU-110 R	Interior painted CMU random area sample (sink area)	Room 110	Classrooms	6.9	12/27/11	
ICMU-205 R	Interior painted CMU random area sample (sink area)	Room 205	Classrooms	6.6	12/27/11	
ICMU-HW R	Interior painted CMU random area sample (doorway across from window)	Hallway (second floor)	Hallways	5.1	12/27/11	
Interior Paint Samples						
PC-IHWR	Interior paint random area sample (interior hallway area)	Hallway (first floor)	Interior hallways	55	2/14/12	
PC-105R	Interior paint random area sample (wall furthest from window)	Room 105	Classrooms	64	2/14/12	
PC-HWR	Interior paint random area sample (hallway area)	Hallway (second floor)	Hallways	47	2/14/12	

Notes:

PCB Concentrations = milligrams per kilogram (mg/kg) (parts per million (ppm)), unless otherwise noted

µg/100 cm² = micrograms per 100 cubic centimeters

Bold = PCBs detected

ND = Not Detected above noted laboratory detection limit

Yellow Highlight = Sealant PCB Concentration ≥ 50 ppm = PCB Bulk Product Waste - Designation may be based upon samples from similar material

Yellow Highlight = Sealant PCB Concentration ≥ 50 ppm = PCB Bulk Product Waste - Designation may be based upon samples from similar material

B = Aroclors 1254 and 1260 observed at 42 and 63 ppm respectively. Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

PCBs in Building Materials Evaluation
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	Material	Sample Location	Material Location	PCB Concentration (ppm; unless noted)	Sample Date	Notes
Exterior Building Material Samples						
Exterior Brick Surround						
EBRK-101 Adj	Exterior brick window surround (adjacent to caulk joint)	Room 101	6 Corner classrooms	3.2	1/16/12	
EBRK-101 6"	Exterior brick window surround (6" from caulk joint)	Room 101	6 Corner classrooms	ND (0.10)	1/16/12	
EBRK-108 Adj	Exterior brick window surround (adjacent to caulk joint)	Room 108	6 Corner classrooms	0.67	12/10/11	
EBRK-108 12"	Exterior brick window surround (12" from caulk joint)	Room 108	6 Corner classrooms	ND (1.0)	12/10/11	
EBRK-116 Adj	Exterior brick window surround (adjacent to caulk joint)	Room 116	6 Corner classrooms	1.14	1/16/12	
EBRK-116 6"	Exterior brick window surround (6" from caulk joint)	Room 116	6 Corner classrooms	ND (0.10)	1/16/12	
ECON-108 Adj	Exterior concrete window surround (adjacent to caulk joint)	Room 108	6 Corner classrooms	2.7	12/10/11	
ECON-108 6"	Exterior concrete window surround (6' caulk joint)	Room 108	6 Corner classrooms	ND (0.10)	1/16/12	
ECON-108 12"	Exterior concrete window surround (12" from caulk joint)	Room 108	6 Corner classrooms	0.37	12/10/11	
EBRK-CAFE Adj	Exterior brick window surround (adjacent to caulk joint)	Cafeteria	Cafeteria-Gym/small windows	ND (0.095)	12/10/11	
EBRK-CAFE 12"	Exterior brick window surround (12" from caulk joint)	Cafeteria	Cafeteria-Gym/small windows	ND (0.091)	12/10/11	
EBRK-D3 Adj	Exterior brick door surround (adjacent to caulk joint)	Door 3	Side B&D Doors	0.63	1/16/12	
EBRK-D4 Adj	Exterior brick door surround (adjacent to caulk joint)	Door 4	Side B&D Doors	ND (0.50)	1/16/12	
EBRK-D9 Adj	Exterior brick door surround (adjacent to caulk joint)	Door 9	Side B&D Doors	0.53	1/16/12	
Exterior CMU Surround						
ECMU-110 Adj	Exterior CMU window surround (adjacent to caulk joint)	Room 110	Classrooms	40	12/10/11	
ECMU-110 12"	Exterior CMU window surround (12" from caulk joint)	Room 110	Classrooms	0.2	12/10/11	
ECMU-112 Adj	Exterior CMU window surround (adjacent to caulk joint)	Room 112	Classrooms	64	12/10/11	
ECMU-112 12"	Exterior CMU window surround (12" from caulk joint)	Room 112	Classrooms	0.19	12/10/11	
ECMU-SWB Adj	Exterior CMU window surround (adjacent to caulk joint)	Stairwell B	4 Stairwells	37	12/10/11	
ECMU-SWB 12"	Exterior CMU window surround (12" from caulk joint)	Stairwell B	4 Stairwells	0.095	12/10/11	
ECMU-HW Adj	Exterior CMU window surround (adjacent from caulk joint)	Hallway (second floor)	Hallways	780	12/10/11	
ECMU-HW 12"	Exterior CMU window surround (12" from caulk joint)	Hallway (second floor)	Hallways	ND (0.10)	12/10/11	
Exterior Concrete Window Sill						
ECON-110 Adj	Exterior concrete window sill (adjacent to caulk joint)	Room 110	Classrooms	5.9	12/10/11	
ECON-110 6"	Exterior concrete window sill (6' caulk joint)	Room 110	Classrooms	0.51	1/16/12	
ECON-110 6" 2	Exterior concrete window sill (6' caulk joint) (duplicate)	Room 110	Classrooms	0.72	1/16/12	
ECON-110 12"	Exterior concrete window sill (12" from caulk joint)	Room 110	Classrooms	ND (0.091)	12/10/11	
ECON-112 Adj	Exterior concrete window sill (adjacent to caulk joint)	Room 112	Classrooms	43	12/10/11	
ECON-112 6'	Exterior concrete window sill (6' caulk joint)	Room 112	Classrooms	0.33	1/16/12	
ECON-112 12"	Exterior concrete window sill (12" from caulk joint)	Room 112	Classrooms	ND (0.091)	12/10/11	
ECON-SWB Adj	Exterior concrete window sill (adjacent to caulk joint)	Stairwell B	4 Stairwells	0.25	12/10/11	
ECON-SWB 12"	Exterior concrete window sill (12" from caulk joint)	Stairwell B	4 Stairwells	ND (0.091)	12/10/11	
Exterior Concrete Threshold						
ECON-D1 Adj	Exterior concrete threshold (adjacent to caulk joint)	Door 1	Main door	1.63	1/16/12	
ECON-D1 6"	Exterior concrete threshold (6" from caulk joint)	Door 1	Main door	0.54	1/16/12	
ECON-D6 Adj	Exterior concrete threshold (adjacent to caulk joint)	Doors 6	Rear door	180	1/16/12	
ECON-D6 6"	Exterior concrete threshold (6" from caulk joint)	Doors 6	Rear door	0.28	1/16/12	
ECON-D2 Adj	Exterior concrete threshold (adjacent to caulk joint)	Door 2	Side B&D Doors	0.14	1/16/12	
ECON-D2 6"	Exterior concrete threshold (6" from caulk joint)	Door 2	Side B&D Doors	ND (0.50)	1/16/12	
ECON-D9 Adj	Exterior concrete threshold (adjacent to caulk joint)	Door 9	Side B&D Doors	0.63	1/16/12	
ECON-D9 6"	Exterior concrete threshold (6" from caulk joint)	Door 9	Side B&D Doors	ND (0.50)	1/16/12	
Wipe Samples						
IW-101	Interior metal window sill wipe	Room101	Classrooms	ND (0.20) µg/100	12/27/11	
108-Sill	Interior metal window sill wipe	Room 108	Classrooms	ND (0.20) µg/100	10/15/11	
110-Sill	Interior metal window sill wipe	Room 110	Classrooms	1.2 µg/100 cm ²	10/15/11	Suspect sample
IW-110	Interior metal window sill wipe (replicate of 110-Sill)	Room 110	Classrooms	ND (0.20) µg/100	12/10/11	
IW-201	Interior metal window sill wipe	Room 201	Classrooms	ND (0.20) µg/100	12/27/11	
IW-202	Interior metal window sill wipe	Room 202	Classrooms	0.21 µg/100 cm ²	12/27/11	
IW-205	Interior metal window sill wipe	Room 205	Classrooms	36.2 µg/100 cm ²	12/10/11	Suspect sample
IW-205 2	Interior metal window sill wipe (replicate of IW-205)	Room 205	Classrooms	ND (0.20) µg/100	12/27/11	
IW-205 C	Interior metal window sill wipe (IW 205 area cleaned with hexane prior)	Room 205	Classrooms	ND (0.20) µg/100	12/27/11	
108-Wall	Interior painted CMU wall wipe (adjacent to window frame joint)	Room 108	Classrooms	ND (0.20) µg/100	10/15/11	
IW-101 W	Interior painted CMU wall wipe (adjacent to window frame joint)	Room 101	Classrooms	ND (0.20) µg/100	12/27/11	
IW-110 W	Interior painted CMU wall wipe (adjacent to window frame joint)	Room 110	Classrooms	0.32 µg/100 cm ²	12/27/11	
IW-205 W	Interior painted CMU wall wipe (adjacent to window frame joint)	Room 205	Classrooms	0.47 µg/100 cm ²	12/27/11	
IW-PC-110	Interior painted CMU wall wipe (2' from caulk joint (PC-110 sample area))	Room 110	Classrooms	ND (0.20) µg/100	2/14/12	
IW-PC-205	Interior painted CMU wall wipe (2' from caulk joint (PC-205 sample area))	Room 205	Classrooms	ND (0.20) µg/100	2/14/12	
IW-PC-HW	Interior painted CMU wall wipe (2' from caulk joint (PC-HW sample area))	Hallway (second floor)	Hallways	ND (0.20) µg/100	2/14/12	
IW-PC-IHWR	Interior painted CMU wall wipe (interior hallway area (PC-IHWR sample area))	Hallway (first floor)	Interior hallways	ND (0.20) µg/100	2/14/12	
IW-PC-105R	Interior painted CMU wall wipe (wall furthest from window (PC-105R sample area))	Room 105	Classrooms	ND (0.20) µg/100	2/14/12	
IW-PC-HWR	Interior painted CMU wall wipe (hallway area (PC-HWR sample area))	Hallway (second floor)	Hallways	ND (0.20) µg/100	2/14/12	
108-Shelf	Interior laminated window shelf wipe	Room 108	Classrooms	ND (0.20) µg/100	10/15/11	
110-Shelf	Interior laminated window shelf wipe	Room 110	Classrooms	0.35 µg/100 cm ²	10/15/11	
IW-108	Interior wood window sill wipe	Room 108	6 Corner classrooms	4.3 µg/100 cm ²	12/10/11	
EW-108	Blue panel in window assembly wipe (exterior)	Room 108	6 Corner classrooms	0.84 µg/100 cm ²	12/10/11	
Univent Interior Samples						
VD-205	Univent interior debris	Room 205	Classrooms (new motor)	440	12/19/11	
VI-204	Univent insulation (top of unit)	Room 204	Classrooms (old motor)	41	1/16/12	
VI-205	Univent insulation (top of unit)	Room 205	Classrooms (new motor)	1.89	1/16/12	
VPW-205	Univent interior front panel metal wipe	Room 205	Classrooms (new motor)	ND (0.20) µg/100	12/19/11	
VMW-204 C	Univent motor cabinet sidewall metal wipe (cleaned with hexane prior)	Room 204	Classrooms (old motor)	ND (0.20) µg/100	1/16/12	
VMW-205 C	Univent motor cabinet sidewall metal wipe (cleaned with hexane prior)	Room 205	Classrooms (new motor)	ND (0.20) µg/100	1/16/12	
VEW-205	Univent interior exhaust area metal wipe	Room 205	Classrooms (new motor)	1.1 µg/100 cm ²	12/19/11	
VEW-204 C	Univent interior exhaust area metal wipe (cleaned with hexane prior)	Room 204	Classrooms (old motor)	ND (0.20) µg/100	1/16/12	
VEW-205 C	Univent interior exhaust area metal wipe (cleaned with hexane prior)	Room 205	Classrooms (new motor)	ND (0.20) µg/100 cm ²	1/16/12	
VSW-205	Univent interior sidewall metal wipe	Room 205	Classrooms (new motor)	19 µg/100 cm ²	12/19/11	
VSW-204 C	Univent interior sidewall metal wipe (cleaned with hexane prior)	Room 204	Classrooms (old motor)	0.65 µg/100 cm ²	1/16/12	
VSW-205 C	Univent interior sidewall metal wipe (cleaned with hexane prior)	Room 205	Classrooms (new motor)	1.27 µg/100 cm ²	1/16/12	

Notes:
PCB Concentrations = milligrams per kilogram (mg/kg) (parts per million (ppm)), unless otherwise noted
µg/100 cm² = micrograms per 100 cubic centimeters
Bold = PCBs detected
ND = Not Detected above noted laboratory detection limit
Yellow Highlight = Sealant PCB Concentration ≥ 50 ppm = PCB Bulk Product Waste - Designation may be based upon samples from similar material
Green Highlighted = ≥ 1 ppm and impacted by PCB Bulk Product Waste = PCB Remediation Waste. Designation may be based upon a similar material's result

PCBs in Building Materials Evaluation
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	Material	Sample Location	Material Location	PCB Concentration (ppm; unless noted)	Sample Date	Notes
Soil						
RM 109 Soil	Soil surrounding building	Soil	Exterior areas	ND (0.12)	1/11/12	
RM 112 Soil	Soil surrounding building	Soil	Exterior areas	ND (0.13)	1/11/12	
Playground Soil	Soil from playground area	Soil	Playground	ND (0.12)	1/11/12	
RM 108 Gravel	Gravel surrounding building	Gravel	Exterior areas	ND (0.10)	1/11/12	

Cleaning Material Samples						
VAF-204	Univent air filter	Room 204	Classrooms (old motor)	27	1/16/12	
VAF-205	Univent air filter	Room 205	Classrooms (new motor)	35	1/16/12	
CD-1	Cleaning debris (Push vacuum (rugs only))	Vacuum bag	Interior areas	6.3	1/16/12	
CD-2	Cleaning debris (Backpack vacuum)	Vacuum canister	Interior areas	12.5	1/16/12	
WW-1	Floor scrubber waste water	Water bin	Interior areas	8.2 µg/L	2/14/12	

µg/L = micrograms per liter

Paint Homolog Samples						
PC-110	Interior paint (2' from caulk joint (ICMU-110 2'))	Room 110	Classrooms	96.6 (B)	1/16/12	
PC-205	Interior paint (2' from caulk joint (ICMU-205 2'))	Room 205	Classrooms	142 (B)	1/16/12	
PC-HW	Interior paint (2' from caulk joint (ICMU-HW 2'))	Second floor hallway	Hallways	35 (B)	1/16/12	

B = Analytes were found in the associated field blank as well as in the sample for all samples

Notes:
PCB Concentrations = milligrams per kilogram (mg/kg) (parts per million (ppm)), unless otherwise noted
µg/100 cm² = micrograms per 100 cubic centimeters
Bold = PCBs detected
ND = Not Detected above noted laboratory detection limit

Yellow Highlight = Sealant PCB Concentration ≥ 50 ppm = PCB Bulk Product Waste - Designation may be based upon samples from similar material
Green Highlighted = ≥ 1 ppm and impacted by PCB Bulk Product Waste = PCB Remediation Waste. Designation may be based upon a similar material's result

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	108 Sill	108 Shelf	110 Sill	110 Shelf	108 Wall	IWC-108	IWG-108	IWC-110	IWG-110A	IWG-110B
Sample Type	Wipe	Wipe	Wipe	Wipe	Wipe	Caulk	Glazing	Caulk	Glazing	Glazing
Laboratory ID	11J0568-01	11J0568-02	11J0568-03	11J0568-04	11J0568-05	11L0423-01	11L0423-02	11L0423-03	11L0423-04	11L0423-05
Sampling Date	10/15/2011	10/15/2011	10/15/2011	10/15/2011	10/15/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1221	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1232	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1242	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1248	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	52,000	81	35,000	68	62
Aroclor 1254	ND (0.20)	ND (0.20)	1.2	0.35	ND (0.20)	35,000	29	30,000	49	24
Aroclor 1260	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1262	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Aroclor 1268	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (3,600)	ND (9.6)	ND (5,000)	ND (9.4)	ND (9.2)
Total PCBs	ND (0.20)	ND (0.20)	1.2	0.35	ND (0.20)	87,000	110	65,000	117	86
QA/QC Notes						2	2	2	2	2

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary column. Data validation is not affected.

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was reported.

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	IWG-110C	IWR-110	IWC-201	IWG-201A	IWG-201B	IWR-201	IWC-205	IWG-205A	IWG-205B	IWR-205
Sample Type	Glazing	Rubber	Caulk	Glazing	Glazing	Rubber	Caulk	Glazing	Glazing	Rubber
Laboratory ID	11L0423-06	11L0423-07	11L0423-08	11L0423-09*	11L0423-10*	11L0423-11	11L0423-12	11L0423-13	11L0423-14	11L0423-15
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1221	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1232	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1242	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1248	31	17,000	ND (4,000)	170	220	26,000	ND (4,500)	84	99	4,600
Aroclor 1254	ND (9.1)	ND (720)	76,000	120	140	5,700	70,000	64	40	1,400
Aroclor 1260	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1262	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Aroclor 1268	ND (9.1)	ND (720)	ND (4,000)	ND 8.5)	ND (19)	ND (1,500)	ND (4,500)	ND (9.1)	ND (9.7)	ND (500)
Total PCBs	31	17,000	76,000	290	360	31,700	70,000	148	139	6,000
QA/QC Notes	2	2	2	2	2	2	2	2	2	2

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

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* IWG-201A and IGW-201B incorrectly labeled as IWR-201A and IWR 201-B, respectively, in the analytical laboratory report.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	IWC-SWB	IWG-SWB	IWC-HW	IWG-HW	IWG-CAFE A	IWG-CAFE B	IWC-113	EWC-108	EWG-108	EWC-110
Sample Type	Caulk	Glazing	Caulk	Glazing	Glazing	Glazing	Caulk	Caulk	Glazing	Caulk
Laboratory ID	11L0423-16	11L0423-17	11L0423-18	11L0423-19	11L0423-20	11L0423-21	11L0423-22	11L0423-23	11L0423-24	11L0423-25
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1221	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1232	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1242	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1248	ND (9,700)	60	ND (9,900)	160	12	ND (10)	23	77,000	ND (1.0)	76,000
Aroclor 1254	76,000	57	67,000	81	11	42 B	8.5	52,000	7.5	48,000
Aroclor 1260	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	63	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1262	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Aroclor 1268	ND (9,700)	ND (9.0)	ND (9,900)	ND (19)	ND (2.3)	ND (10)	ND (4.0)	ND (4,000)	ND (1.0)	ND (4,000)
Total PCBs	76,000	117	67,000	241	23	63	31.5	129,000	7.5	124,000
QA/QC Notes	2	2	2	2		2, 4		2	5	2

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

- 1 = Elevated reporting limit due to sample matrix interference. Requested
- 2 = The surrogate recovery for this sample is not available due to sample d
- 3 = The surrogate recovery for this sample cannot be accurately quantified
- 4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppr
- 5 = Surrogate recovery is outside of control limits in confirmatory column,
- 6 = Result was confirmed using a dissimilar column. Relative percent diffe
- 7 = Due to surrogate recovery non-conformance on the primary detector, 1
- 8 = Surrogate recovery outside criteria.
- 9 = Laboratory fortified blank duplicate RPD is outside of control limits. Re

1 high analyte concentration and/or matrix interferences.
present in the sample extract.

tion is not affected.
sult was reported.

· Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	EWG-110	EWG-112	EWG-112	EWG-116	EWG-116	EWG-SWB	EWG-SWB	EWG-HW	EWG-HW	EWG-CAFE
Sample Type	Glazing	Caulk	Glazing	Caulk	Glazing	Caulk	Glazing	Caulk	Glazing	Caulk
Laboratory ID	11L0423-26	11L0423-27	11L0423-28	11L0423-29	11L0423-30	11L0423-31	11L0423-32	11L0423-33	11L0423-34	11L0423-35
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1221	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1232	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1242	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1248	26	74,000	3.2	67,000	5.8	52,000	5.8	80,000	89	2.3
Aroclor 1254	ND (10)	54,000	ND (1.0)	55,000	ND (2.0)	47,000	2.3	57,000	65	2.4
Aroclor 1260	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1262	ND (10)	ND (4,000)	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Aroclor 1268	ND (10)	<4000	ND (1.0)	ND (4,000)	ND (2.0)	ND (4,000)	ND (1.0)	ND (8,000)	ND (10)	ND (1.0)
Total PCBs	26	128,000	3.2	122,000	5.8	99,000	8.1	137,000	154	4.7
QA/QC Notes	2	2		2		2		2	2	

Notes

Concentrations of
Concentrations of
Concentrations of

QA/QC Notes:

1 = Elevated repor
2 = The surrogate
3 = The surrogate
4/B = Aroclor 125
5 = Surrogate reco
6 = Result was con
7 = Due to surroga
8 = Surrogate reco
9 = Laboratory for

detection limit not met.
ilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
due to interference from coeluting organic compounds present in the sample extract.
n.
but within control limits on primary column. Data validation is not affected.
rence between the two results was > 40%. The higher result was reported.
:he lower of the two results was reported.
duced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	EWG-CAFE A	EWG-CAFE B	EWG-CAFE C	EWG-103	EWG-115	IW-108	EW-108	IW-110	IW-205	ICMU-108 Adj
Sample Type	Glazing	Glazing	Glazing	Glazing	Glazing	Wipe	Wipe	Wipe	Wipe	CMU
Laboratory ID	11L0423-36	11L0423-37	11L0423-38	11L0423-39	11L0423-40	11L0425-01	11L0425-02	11L0425-03	11L0425-04	11L0425-05
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Aroclor 1221	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Aroclor 1232	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Aroclor 1242	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Aroclor 1248	ND (1.0)	ND (1.0)	ND (10)	2.5	ND (0.97)	4.3	0.46	ND (0.20)	17	260
Aroclor 1254	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	0.38	ND (0.20)	14	110
Aroclor 1260	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	5.2	ND (48)
Aroclor 1262	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Aroclor 1268	ND (1.0)	ND (1.0)	ND (10)	ND (1.0)	ND (0.97)	ND (1.0)	ND (0.20)	ND (0.20)	ND (2.0)	ND (48)
Total PCBs	ND (1.0)	ND (1.0)	ND (10)	2.5	ND (0.97)	4.3	0.84	ND (0.20)	36.2	370
QA/QC Notes		2	1, 2							2

bulk samples are in parts per million (ppm)

wipe samples are in µg/100 cm²

waste water samples are in µg/L

ting limit due to sample matrix interference. Requested detection limit not met.

recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

4 observed in associated Method Blank at up to 0.75 ppm.

very is outside of control limits in confirmatory column, but within control limits on primary column. Data validation is not affected.

firmed using a dissimilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

te recovery non-conformance on the primary detector, the lower of the two results was reported.

very outside criteria.

ified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	ICMU-108 12in	ICMU-110 Adj	ICMU-110 12in	ICMU-205 Adj	ICMU-205 12in	IBRK-CAFE Adj	IBRK-Cafe 12in	ICMU-SWB Adj	ICMU-SWB 12in	ICMU-HW Adj
Sample Type	CMU	CMU	CMU	CMU	CMU	Brick	Brick	CMU	CMU	CMU
Laboratory ID	11L0425-06	11L0425-07	11L0425-08	11L0425-09	11L0425-10	11L0425-11	11L0425-12	11L0425-13	11L0425-14	11L0425-15
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1221	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1232	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1242	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1248	4.1	100	19	12	4.7	ND (0.095)	ND (0.091)	ND (100)	0.55	45
Aroclor 1254	ND (1.8)	100	23	12	5.1	ND (0.095)	ND (0.091)	320	1.1	56
Aroclor 1260	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1262	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Aroclor 1268	ND (1.8)	ND (20)	ND (2.5)	ND (1.9)	ND (0.91)	ND (0.095)	ND (0.091)	ND (100)	ND (0.10)	ND (9.5)
Total PCBs	4.1	200	42	24	9.8	ND (0.095)	ND (0.091)	320	1.65	101
QA/QC Notes	6	2				5	5	2		2

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte conc

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sam

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary column. Data validation is not affected

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was reported.

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	ICMU-HW 12in	EBRK-108 Adj	EBRK-108 12in	ECON-108 Adj	ECON-108 12in	ECON-110 Adj	ECON-110 12"	ECMU-110 Adj	ECMU-110 12"	ECON-112 Adj
Sample Type	CMU	Brick	Brick	Concrete	Concrete	Concrete	Concrete	CMU	CMU	Concrete
Laboratory ID	11L0425-16	11L0425-17	11L0425-18	11L0425-19	11L0425-20	11L0425-21	11L0425-22	11L0425-23	11L0425-24	11L0425-25
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1221	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1232	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1242	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1248	2.9	0.3	ND (0.10)	1.2	0.17	2.4	ND (0.091)	23	ND (0.10)	ND (4.8)
Aroclor 1254	2.1	0.37	ND (0.10)	1.5	0.2	3.5	ND (0.091)	17	0.2	43
Aroclor 1260	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1262	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Aroclor 1268	ND (0.45)	ND (0.10)	ND (0.10)	ND (0.19)	ND (0.091)	ND (0.48)	ND (0.091)	ND (2.5)	ND (0.10)	ND (4.8)
Total PCBs	5	0.67	ND (0.10)	2.7	0.37	5.9	ND (0.091)	40	0.2	43
QA/QC Notes			5		6, 7, 8					2

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not

2 = The surrogate recovery for this sample is not available due to sample dilution below the s

3 = The surrogate recovery for this sample cannot be accurately quantified due to interferenc

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control

6 = Result was confirmed using a dissimilar column. Relative percent difference between the

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the tw

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is

entrations and/or matrix interferences.
 ple extract.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	ECON-112 12"	ECMU-112 Adj	ECMU-112 12"	ECON-SWB Adj	ECON-SWB 12"	ECMU-SWB Adj	ECMU-SWB 12"	ECMU-HW Adj	ECMU-HW 12"	EBRK-CAFE Adj
Sample Type	Concrete	CMU	CMU	Concrete	Concrete	CMU	CMU	CMU	CMU	Brick
Laboratory ID	11L0425-26	11L0425-27	11L0425-28	11L0425-29	11L0425-30	11L0425-31	11L0425-32	11L0425-33	11L0425-34	11L0425-35
Sampling Date	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011	12/10/2011
Aroclor 1016	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1221	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1232	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1242	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1248	ND (0.091)	34	0.19	0.12	ND (0.091)	37	0.095	380	ND (0.10)	ND (0.095)
Aroclor 1254	ND (0.091)	30	ND (0.10)	0.13	ND (0.091)	ND (4.8)	ND (0.09)	400	ND (0.10)	ND (0.095)
Aroclor 1260	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1262	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Aroclor 1268	ND (0.091)	ND (5.0)	ND (0.10)	ND (0.095)	ND (0.091)	ND (4.8)	ND (0.09)	ND (50)	ND (0.10)	ND (0.095)
Total PCBs	ND (0.091)	64	0.19	0.25	ND (0.091)	37	0.095	780	ND (0.10)	ND (0.095)
QA/QC Notes		2				2		2		

Notes

Concentrations of bulk samples are i
Concentrations of wipe samples are i
Concentrations of waste water samp

QA/QC Notes:

1 = Elevated reporting limit due to sa
2 = The surrogate recovery for this sa
3 = The surrogate recovery for this sa
4/B = Aroclor 1254 observed in asso
5 = Surrogate recovery is outside of c
6 = Result was confirmed using a diss
7 = Due to surrogate recovery non-cc
8 = Surrogate recovery outside criteri
9 = Laboratory fortified blank duplica

met.
urrogate reporting limit required from high analyte concentration and/or matrix interferences.
e from coeluting organic compounds present in the sample extract.
limits on primary column. Data validation is not affected.
two results was > 40%. The higher result was reported.
o results was reported.
anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	EBRK-CAFE 12in	VD-205	VEW-205	VPW-205	VSW-205	IW-205 2	IW-205 C	IW-101	IW-201	IW-202
Sample Type	Brick	Dust/Debris	Wipe	Wipe	Wipe	Wipe	Wipe	Wipe	Wipe	Wipe
Laboratory ID	11L0425-36	11L0747-01	11L0747-03	11L0747-04	11L0747-05	11L0956-01	11L0956-02	11L0956-03	11L0956-04	11L0956-05
Sampling Date	12/10/2011	12/19/2011	12/19/2011	12/19/2011	12/19/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011
Aroclor 1016	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1221	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1232	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1242	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1248	ND (0.091)	170	ND (0.20)	ND (0.20)	7	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1254	ND (0.091)	270	1.1	ND (0.20)	12	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.21
Aroclor 1260	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1262	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Aroclor 1268	ND (0.091)	ND (53)	ND (0.20)	ND (0.20)	ND (2.0)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)
Total PCBs	ND (0.091)	440	1.1	ND (0.20)	19	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	0.21
QA/QC Notes		2								

n parts per million (ppm)

n µg/100 cm²

les are in µg/L

mple matrix interference. Requested detection limit not met.

mple is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.

mple cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

iated Method Blank at up to 0.75 ppm.

ontrol limits in confirmatory column, but within control limits on primary column. Data validation is not affected.

imilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

nformance on the primary detector, the lower of the two results was reported.

a.

te RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	IW-101 W	IW-110 W	IW-205 W	ICMU-108 2ft	ICMU-110 2ft	ICMU-205 2ft	ICMU-SWB 2ft	ICMU-HW 2ft	ICMU-110 R	ICMU-205 R
Sample Type	Wipe	Wipe	Wipe	CMU	CMU	CMU	CMU	CMU	CMU	CMU
Laboratory ID	11L0956-06	11L0956-07	11L0956-08	11L0956-09	11L0956-10	11L0956-11	11L0956-12	11L0956-13	11L0956-14	11L0956-15
Sampling Date	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011	12/27/2011
Aroclor 1016	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1221	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1232	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1242	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1248	ND (0.20)	ND (0.20)	ND (0.20)	2.9	3.2	5.7	1.6	0.83	4.2	4
Aroclor 1254	ND (0.20)	0.32	0.47	ND (0.48)	3	7.2	2.7	0.67	2.7	2.6
Aroclor 1260	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1262	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Aroclor 1268	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.48)	ND (0.45)	ND (0.95)	ND (0.45)	ND (0.10)	ND (0.95)	ND (1.0)
Total PCBs	ND (0.20)	0.32	0.47	2.9	6.2	12.9	4.3	1.5	6.9	6.6
QA/QC Notes										

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in $\mu\text{g}/100\text{ cm}^2$

Concentrations of waste water samples are in $\mu\text{g}/\text{L}$

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or n

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary column. Data validation is not affected.

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was reported.

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	ICMU-HW R	RM 109 Soil	RM 112 Soil	Playground Soil	Rm 108 Gravel	VAF-204	VAF-205	VI-204	VI-205	VMW-204 C
Sample Type	CMU	Soil	Soil	Soil	Gravel	Air Filter	Air Filter	Insulation	Insulation	Wipe
Laboratory ID	11L0956-16	12A0451-01	12A0451-02	12A0451-03	12A0451-04	12A0493-04	12A0493-05	12A0493-06	12A0493-07	12A0493-08
Sampling Date	12/27/2011	1/11/2012	1/11/2012	1/11/2012	1/11/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012
Aroclor 1016	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1221	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1232	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1242	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1248	2.7	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	13	14	27	0.79	ND (0.20)
Aroclor 1254	2.4	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	14	21	14	1.1	ND (0.20)
Aroclor 1260	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1262	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Aroclor 1268	ND (0.48)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	ND (2.5)	ND (2.5)	ND (3.6)	ND (0.11)	ND (0.20)
Total PCBs	5.1	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.10)	27	35	41	1.89	ND (0.20)
QA/QC Notes								2		

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting o

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary c

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was >

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was repo

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any

matrix interferences.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	VMW-205 C	VEW-204 C	VEW-205 C	VSW-204 C	VSW-205 C	ECON-108 6in	ECON-110 6in	ECON-110 6in 2	ECON-112 6in	EBRK-101 Adj
Sample Type	Wipe	Wipe	Wipe	Wipe	Wipe	Concrete	Concrete	Concrete	Concrete	Brick
Laboratory ID	12A0493-09	12A0493-10	12A0493-11	12A0493-12	12A0493-13	12A0493-14	12A0493-15	12A0493-16	12A0493-17	12A0493-18
Sampling Date	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012
Aroclor 1016	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1221	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1232	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1242	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1248	ND (0.20)	ND (0.20)	ND (0.20)	0.32	0.36	ND (0.10)	0.22	0.26	0.16	1.8
Aroclor 1254	ND (0.20)	ND (0.20)	ND (0.20)	0.33	0.91	ND (0.10)	0.29	0.46	0.17	1.4
Aroclor 1260	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1262	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Aroclor 1268	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.10)	ND (0.095)	ND (0.091)	ND (0.10)	ND (0.20)
Total PCBs	ND (0.20)	ND (0.20)	ND (0.20)	0.65	1.27	ND (0.10)	0.51	0.72	0.33	3.2
QA/QC Notes										

Notes

Concentrations of bulk samples are in parts per million

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interf

2 = The surrogate recovery for this sample is not availat

3 = The surrogate recovery for this sample cannot be ac

4/B = Aroclor 1254 observed in associated Method Blar

5 = Surrogate recovery is outside of control limits in con

6 = Result was confirmed using a dissimilar column. Rel

7 = Due to surrogate recovery non-conformance on the

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside o

limit required from high analyte concentration and/or matrix interferences.
organic compounds present in the sample extract.

olumn. Data validation is not affected.

40%. The higher result was reported.

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reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	EBRK-116 Adj	CD-1	CD-2	ECON-D1 Adj	ECON-D6 Adj	EBRK-D3 Adj	EBRK-D4 Adj	EBRK-D9 Adj	EBRK-101 6"	EBRK-116 6"
Sample Type	Brick	Cleaning Debris	Cleaning Debris	Concrete	Concrete	Brick	Brick	Brick	Concrete	Concrete
Laboratory ID	12A0493-19	12A0493-20	12A0493-21	12A0492-01	12A0492-02	12A0586-01	12A0586-02	12A0586-03	12A0943-01	12A0943-02
Sampling Date	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012
Aroclor 1016	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1221	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1232	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1242	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1248	0.38	4.4	8.1	0.33	180	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1254	0.76	1.9	4.4	1.3	ND (45)	0.63	ND (0.50)	0.53	ND (0.10)	ND (0.10)
Aroclor 1260	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1262	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Aroclor 1268	ND (0.091)	ND (0.45)	ND (0.95)	ND (0.19)	ND (45)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.10)	ND (0.10)
Total PCBs	1.14	6.3	12.5	1.63	180	0.63	ND (0.50)	0.53	ND (0.10)	ND (0.10)
QA/QC Notes					2					

(ppm)

ference. Requested detection limit not met.

le due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interferences.
curately quantified due to interference from coeluting organic compounds present in the sample extract.

ik at up to 0.75 ppm.

firmatory column, but within control limits on primary column. Data validation is not affected.

ative percent difference between the two results was > 40%. The higher result was reported.

primary detector, the lower of the two results was reported.

f control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	ECON-D1 6"	ECON-D6 6"	ECON-D2 Adj	ECON-D2 6"	ECON-D9 Adj	ECON-D9 6"	EDC-D-3	EDC-D-4	EDC-D-9	PC-IHWR
Sample Type	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Caulk	Caulk	Caulk	Paint
Laboratory ID	12A0943-03	12A0943-04	12B0197-01	12B0197-02	12B0197-03	12B0197-04	12A0669-01	12A0669-02	12A0669-03	12B0517-01
Sampling Date	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/16/2012	1/20/2012	1/20/2012	1/20/2012	2/14/2012
Aroclor 1016	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1221	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1232	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1242	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1248	ND (0.12)	0.28	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	41
Aroclor 1254	0.54	ND (0.10)	0.14	ND (0.10)	0.63	ND (0.10)	79,000	110,000	73,000	14
Aroclor 1260	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1262	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Aroclor 1268	ND (0.12)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (9,900)	ND (8,600)	ND (9,500)	ND (4.9)
Total PCBs	0.54	0.28	0.14	ND (0.10)	0.63	ND (0.10)	79,000	110,000	73,000	55
QA/QC Notes							2	2	2	

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in µg/100 cm²

Concentrations of waste water samples are in µg/L

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting limit required from high analyte concentration and/or matrix interference:

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary column. Data validation is not affected.

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was > 40%. The higher result was reported.

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was reported.

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for Aroclor 1260.

Table 3 - PCB Bulk Sample Analytical Data
Burke Elementary School
127 Birch Street
Peabody, Massachusetts

Sample ID	PC-105R	PC-HWR	IW-PC-110	IW-PC-205	IW-PC-HW	IW-PC-IHWR	IW-PC-105R	IW-PC-HWR	WW-1
Sample Type	Paint	Paint	Wipe	Wipe	Wipe	Wipe	Wipe	Wipe	Waste Water
Laboratory ID	12B0517-02	12B0517-03	12B0517-04	12B0517-05	12B0517-06	12B0517-07	12B0517-08	12B0517-09	12B0517-10
Sampling Date	2/14/2012	2/14/2012	2/14/2012	2/14/2012	2/14/2012	2/14/2012	2/14/2012	2/14/2012	2/14/2012
Aroclor 1016	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1221	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1232	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1242	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1248	29	31	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	4
Aroclor 1254	35	16	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	4.2
Aroclor 1260	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1262	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Aroclor 1268	ND (4.9)	ND (4.7)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (1.0)
Total PCBs	64	47	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	8.2
QA/QC Notes			9	9	9	9	9	9	

Notes

Concentrations of bulk samples are in parts per million (ppm)

Concentrations of wipe samples are in $\mu\text{g}/100\text{ cm}^2$

Concentrations of waste water samples are in $\mu\text{g}/\text{L}$

QA/QC Notes:

1 = Elevated reporting limit due to sample matrix interference. Requested detection limit not met.

2 = The surrogate recovery for this sample is not available due to sample dilution below the surrogate reporting

3 = The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting o

4/B = Aroclor 1254 observed in associated Method Blank at up to 0.75 ppm.

5 = Surrogate recovery is outside of control limits in confirmatory column, but within control limits on primary c

6 = Result was confirmed using a dissimilar column. Relative percent difference between the two results was > .

7 = Due to surrogate recovery non-conformance on the primary detector, the lower of the two results was repo

8 = Surrogate recovery outside criteria.

9 = Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any

Table 4 - Total Indoor Air PCB Homolog Concentrations
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

Sample Date	10/15/11	11/21/11	12/19/11	1/16/12	2/14/12	Average PCB Homolog Concentration	Univent Motor
Sample Location	Total PCB Homolog Concentration (µg/m³)						New/Old
Room 101	-	-	0.086	-	-	0.086	New
Room 102	-	-	0.146	-	-	0.146	New
Room 103	-	-	0.112	-	0.071	0.092	Old
Room 104	-	0.263	0.130	-	-	0.197	Old
Room 105	-	-	0.090	0.201 (B)	0.132	0.111	New
Room 106	-	-	0.143	-	-	0.143	New
Room 107	-	-	0.160	-	-	0.160	New
Room 108	0.28	0.218	0.178	-	-	0.198	Old
Room 109	-	-	0.161	-	-	0.161	Old
Room 110	0.59	0.270	0.159	-	-	0.215	New
Room 111	-	-	0.217	-	0.216	0.217	New
Room 112	-	-	0.112	-	-	0.112	New
Room 113	-	-	0.124	-	-	0.124	Old
Room 114	0.26	-	0.180	0.27 (B)	0.25	0.22	New
Room 115	-	-	0.155	-	-	0.155	New
Room 116	-	0.183	0.167	-	-	0.175	New
Room 201	-	0.32	0.47 / 0.46	-	-	0.39	Old
Room 202	-	-	0.42	0.31 (B)	-	0.42	New
Room 203	-	-	0.32	-	-	0.32	New
Room 204	-	-	0.31	-	0.36	0.34	Old
Room 205	0.75	0.37	0.47 / 0.43	-	-	0.41	New
Room 206	-	-	0.45	-	-	0.45	New
Room 207	-	-	0.41	-	-	0.41	New
Room 208	-	-	0.43	-	-	0.43	New
Gymnasium	-	-	0.055	-	-	0.055	Not present
Cafeteria	0.259	-	0.093	-	-	0.176	Not present
Kitchen		-	0.0032	-	-	0.0032	Not present
Guidance Office	-	0.090	-	-	-	0.090	Not present
Ambient (Outdoor)	-	-	ND (0.0068)	-	-	ND (0.0068)	Not present
Field Blank	-	ND (0.0050)	ND (0.0050)	0.060 (B)	ND (0.0050)	ND (0.0050)	Not present

Notes

µg/m³ = microgram per cubic meter = 1,000 ng/m³ (nanograms per cubic meter)

- = Not sampled

ND = Not detected above the noted detection limit

(Dup.) = Duplicate sample

Ambient (outdoor) sample collected outside of building

Average PCB Homolog Concentration = Average concentration following interim measure implementation (after 10/15/11)

(Data from 1/16/12 sampling event not included in average values)

(B) = Analyte was found in the associated field blank as well as in the sample

Table 5 - PCB Air Analytical Data
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

	Sample ID	Room 101	Room 102	Room 103	Room 103	Room 104	Room 104	Room 105	Room 105	Room 105	Room 106	Room 107	Room 108
	Laboratory ID	11L0754-01	11L0754-02	11L0754-03	12B0521-01	11K0778-01	11L0754-04	11L0754-05	12A0508-03	12B0521-02	11L0754-06	11L0754-07	11J0567-02
	Sample Date	12/19/11	12/19/11	12/19/11	2/14/12	11/21/11	12/19/11	12/19/11	1/16/12	2/14/12	12/19/11	12/19/11	10/15/11
Monochlorobiphenyls	µg/m ³	ND (0.0014)	0.017	0.019	ND (0.001)	0.038	0.015	ND (0.0014)	0.0081	0.0083	0.0087	0.014	0.040
Dichlorobiphenyls	µg/m ³	ND (0.0014)	0.0035	0.004	ND (0.001)	0.033	ND (0.0014)	ND (0.0014)	0.0025	ND (0.001)	ND (0.0014)	ND (0.0014)	ND (0.0055)
Trichlorobiphenyls	µg/m ³	0.044	0.062	0.021	0.038	0.095	0.052	0.040	0.086 (B)	0.063	0.062	0.070	0.14
Tetrachlorobiphenyls	µg/m ³	0.031	0.048	0.050	0.021	0.074	0.042	0.043	0.089 (B)	0.050	0.056	0.057	0.088
Pentachlorobiphenyls	µg/m ³	0.0059	0.010	0.012	0.012	0.018	0.013	0.0034	0.015 (B)	0.011	0.011	0.015	0.016
Hexachlorobiphenyls	µg/m ³	0.0052	0.0055	0.0064	ND (0.0021)	0.005	0.008	0.0037	ND (0.0021)	ND (0.0021)	0.0054	0.0042	ND (0.011)
Heptachlorobiphenyls	µg/m ³	ND (0.0042)	ND (0.0042)	ND (0.0042)	ND (0.0031)	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.0031)	ND (0.0031)	ND (0.0042)	ND (0.0042)	ND (0.011)
Octachlorobiphenyls	µg/m ³	ND (0.0042)	ND (0.0042)	ND (0.0042)	ND (0.0031)	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.0031)	ND (0.0031)	ND (0.0042)	ND (0.0042)	ND (0.017)
Nonachlorobiphenyls	µg/m ³	ND (0.007)	ND (0.0069)	ND (0.0069)	ND (0.0051)	ND (0.01)	ND (0.007)	ND (0.007)	ND (0.0052)	ND (0.0052)	ND (0.0069)	ND (0.007)	ND (0.028)
Decachlorobiphenyl	µg/m ³	ND (0.007)	ND (0.0069)	ND (0.0069)	ND (0.0051)	ND (0.01)	ND (0.007)	ND (0.007)	ND (0.0052)	ND (0.0052)	ND (0.0069)	ND (0.007)	ND (0.028)
Total Polychlorinated Biphenyls	µg/m ³	0.086	0.146	0.112	0.071	0.263	0.130	0.090	0.20 (B)	0.132	0.143	0.160	0.28

Notes

- µg/m3 = microgram per cubic meter = 1,000 ng/m3 (nanograms per cubic meter).
- - = Not sampled.
- ND = Not detected above the noted detection limit.
- (B) = Analyte was found in the associated field blank as well as in the sample.
- Ambient (outdoor) sample collected outside of building.
- EPA Target Value - Kindergarten Student = 0.100 µg/m3
- EPA Target Value - Elementary School Student = 0.300 µg/m3
- EPA Target Value - Adult = 0.450 µg/m3

Table 5 - PCB Air Analytical Data
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

	Sample ID	Room 108	Room 108	Room 109	Room 110	Room 110	Room 110	Room 111	Room 111	Room 112	Room 113	Room 114	Room 114
	Laboratory ID	11K0778-02	11L0754-08	11L0754-09	11J0567-03	11K0778-03	11L0754-10	11L0754-11	12B0521-03	11L0754-12	11L0754-13	11J0567-04	11L0754-14
	Sample Date	11/21/11	12/19/11	12/19/11	10/15/11	11/21/11	12/19/11	12/19/11	2/14/12	12/19/11	12/19/11	10/15/11	12/19/11
Monochlorobiphenyls	µg/m ³	0.028	0.021	0.0075	0.15	0.035	0.021	0.021	0.0056	ND (0.0014)	0.0096	0.036	0.019
Dichlorobiphenyls	µg/m ³	0.027	ND (0.0014)	ND (0.0014)	0.039	0.031	ND (0.0014)	0.0061	0.010	ND (0.0014)	ND (0.0014)	ND (0.0056)	ND (0.0014)
Trichlorobiphenyls	µg/m ³	0.090	0.081	0.068	0.23	0.099	0.064	0.083	0.083	0.041	0.057	0.11	0.074
Tetrachlorobiphenyls	µg/m ³	0.062	0.061	0.062	0.14	0.077	0.048	0.067	0.080	0.041	0.037	0.089	0.060
Pentachlorobiphenyls	µg/m ³	0.011	0.012	0.016	0.031	0.021	0.020	0.030	0.030	0.021	0.015	0.023	0.021
Hexachlorobiphenyls	µg/m ³	ND (0.004)	0.0034	0.0078	ND (0.011)	0.0073	0.006	0.010	0.0069	0.0094	0.0053	ND (0.011)	0.0061
Heptachlorobiphenyls	µg/m ³	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.017)	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.003)	ND (0.0042)	ND (0.0042)	ND (0.017)	ND (0.0042)
Octachlorobiphenyls	µg/m ³	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.017)	ND (0.006)	ND (0.0042)	ND (0.0042)	ND (0.003)	ND (0.0042)	ND (0.0042)	ND (0.017)	ND (0.0042)
Nonachlorobiphenyls	µg/m ³	ND (0.01)	ND (0.007)	ND (0.007)	ND (0.028)	ND (0.01)	ND (0.0069)	ND (0.0069)	ND (0.0051)	ND (0.0069)	ND (0.0069)	ND (0.028)	ND (0.0069)
Decachlorobiphenyl	µg/m ³	ND (0.01)	ND (0.007)	ND (0.007)	ND (0.028)	ND (0.01)	ND (0.0069)	ND (0.0069)	ND (0.0051)	ND (0.0069)	ND (0.0069)	ND (0.028)	ND (0.0069)
Total Polychlorinated Biphenyls	µg/m ³	0.218	0.178	0.161	0.59	0.270	0.159	0.217	0.216	0.112	0.124	0.26	0.180

Notes

- µg/m3 = microgram per cubic meter = 1,000 ng/m3 (nanograms per cubic meter).
- - = Not sampled.
- ND = Not detected above the noted detection limit.
- (B) = Analyte was found in the associated field blank as well as in the sample.
- Ambient (outdoor) sample collected outside of building.
- EPA Target Value - Kindergarten Student = 0.100 µg/m3
- EPA Target Value - Elementary School Student = 0.300 µg/m3
- EPA Target Value - Adult = 0.450 µg/m3

Table 5 - PCB Air Analytical Data
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

	Sample ID	Room 114	Room 114	Room 115	Room 116	Room 116	Guidance	Gymnasium	Cafeteria	Cafeteria	Kitchen	Room 201	Room 201
	Laboratory ID	12A0508-02	12B0521-04	11L0754-15	11K0778-05	11L0754-16	11K0778-06	11L0754-17	11J0567-01	11L0754-18	11L0754-19	11K0778-07	11L0754-20
	Sample Date	1/16/12	2/14/12	12/19/11	11/21/11	12/19/11	11/21/11	12/19/11	10/15/11	12/19/11	12/19/11	11/21/11	12/19/11
Monochlorobiphenyls	µg/m ³	0.013	0.0056	0.0056	0.018	0.015	0.014	ND (0.0014)	0.040	ND (0.0014)	ND (0.0014)	0.032	0.028
Dichlorobiphenyls	µg/m ³	ND (0.001)	0.011	ND (0.0014)	0.016	ND (0.0014)	ND (0.002)	ND (0.0014)	ND (0.0055)	ND (0.0014)	ND (0.0014)	0.026	0.026
Trichlorobiphenyls	µg/m ³	0.11 (B)	0.10	0.069	0.069	0.068	0.038	0.025	0.091	0.024	ND (0.0014)	0.12	0.16
Tetrachlorobiphenyls	µg/m ³	0.11 (B)	0.093	0.055	0.062	0.062	0.026	0.015	0.076	0.025	ND (0.0028)	0.092	0.16
Pentachlorobiphenyls	µg/m ³	0.027 (B)	0.037	0.019	0.018	0.017	0.012	0.010	0.028	0.015	ND (0.0028)	0.05	0.076
Hexachlorobiphenyls	µg/m ³	0.006	0.0083	0.0062	ND (0.004)	0.0053	ND (0.004)	0.0049	0.024	0.024	0.0032	ND (0.004)	0.015
Heptachlorobiphenyls	µg/m ³	ND (0.0031)	ND (0.0031)	ND (0.0042)	ND (0.006)	ND (0.0041)	ND (0.006)	ND (0.0042)	ND (0.017)	0.0051	ND (0.0042)	ND (0.006)	ND (0.0041)
Octachlorobiphenyls	µg/m ³	ND (0.0031)	ND (0.0031)	ND (0.0042)	ND (0.006)	ND (0.0041)	ND (0.006)	ND (0.0042)	ND (0.017)	ND (0.0041)	ND (0.0042)	ND (0.006)	ND (0.0041)
Nonachlorobiphenyls	µg/m ³	ND (0.0052)	ND (0.0051)	ND (0.0069)	ND (0.01)	ND (0.0069)	ND (0.01)	ND (0.007)	ND (0.028)	ND (0.0068)	ND (0.007)	ND (0.01)	ND (0.0069)
Decachlorobiphenyl	µg/m ³	ND (0.0052)	ND (0.0051)	ND (0.0069)	ND (0.01)	ND (0.0069)	ND (0.01)	ND (0.007)	ND (0.028)	ND (0.0068)	ND (0.007)	ND (0.01)	ND (0.0069)
Total Polychlorinated Biphenyls	µg/m ³	0.27 (B)	0.25	0.155	0.183	0.167	0.090	0.055	0.259	0.093	0.0032	0.32	0.47

Notes

- µg/m3 = microgram per cubic meter = 1,000 ng/m3 (nanograms per cubic meter).
- - = Not sampled.
- ND = Not detected above the noted detection limit.
- (B) = Analyte was found in the associated field blank as well as in the sample.
- Ambient (outdoor) sample collected outside of building.
- EPA Target Value - Kindergarten Student = 0.100 µg/m3
- EPA Target Value - Elementary School Student = 0.300 µg/m3
- EPA Target Value - Adult = 0.450 µg/m3

Table 5 - PCB Air Analytical Data
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

	Sample ID	Room 201	Room 202	Room 202	Room 203	Room 204	Room 204	Room 205	Room 205	Room 205	Room 205	Room 206	Room 207
	Laboratory ID	11L0754-21	11L0754-22	12A0508-01	11L0754-23	11L0754-24	12B0521-05	11J0567-05	11K0778-08	11L0754-25	11L0754-26	11L0754-27	11L0754-28
	Sample Date	12/19/11	12/19/11	1/16/12	12/19/11	12/19/11	2/14/12	10/15/11	11/21/11	12/19/11	12/19/11	12/19/11	12/19/11
Monochlorobiphenyls	µg/m ³	0.026	0.029	0.013	0.017	0.017	0.0052	0.051	0.028	0.030	0.027	0.024	0.027
Dichlorobiphenyls	µg/m ³	0.025	0.026	0.006	ND	ND (0.0014)	0.013	0.0088	0.036	0.042	0.038	0.035	0.031
Trichlorobiphenyls	µg/m ³	0.16	0.16	0.12 (B)	0.13	0.12	0.14	0.29	0.13	0.17	0.15	0.16	0.17
Tetrachlorobiphenyls	µg/m ³	0.16	0.15	0.13 (B)	0.12	0.13	0.14	0.27	0.12	0.16	0.14	0.16	0.14
Pentachlorobiphenyls	µg/m ³	0.071	0.042	0.035 (B)	0.039	0.033	0.050	0.11	0.048	0.050	0.057	0.061	0.034
Hexachlorobiphenyls	µg/m ³	0.015	0.013	0.0074 (B)	0.013	0.011	0.0098	0.020	0.0097	0.016	0.014	0.013	0.011
Heptachlorobiphenyls	µg/m ³	ND (0.0041)	ND (0.0041)	ND (0.0031)	ND (0.0041)	ND (0.0042)	ND (0.003)	ND (0.017)	ND (0.0061)	ND (0.0042)	ND (0.0042)	ND (0.0042)	ND (0.0042)
Octachlorobiphenyls	µg/m ³	ND (0.0041)	ND (0.0041)	ND (0.0031)	ND (0.0041)	ND (0.0042)	ND (0.003)	ND (0.017)	ND (0.0061)	ND (0.0042)	ND (0.0042)	ND (0.0042)	ND (0.0042)
Nonachlorobiphenyls	µg/m ³	ND (0.0069)	ND (0.0069)	ND (0.0052)	ND (0.0069)	ND (0.007)	ND (0.005)	ND (0.028)	ND (0.010)	ND (0.007)	ND (0.007)	ND (0.007)	ND (0.007)
Decachlorobiphenyl	µg/m ³	ND (0.0069)	ND (0.0069)	ND (0.0052)	ND (0.0069)	ND (0.007)	ND (0.005)	ND (0.028)	ND (0.010)	ND (0.007)	ND (0.007)	ND (0.007)	ND (0.007)
Total Polychlorinated Biphenyls	µg/m ³	0.46	0.42	0.31 (B)	0.32	0.31	0.36	0.75	0.37	0.47	0.43	0.45	0.41

- Notes**
- µg/m3 = microgram per cubic meter = 1,000 ng/m3 (nanograms per cubic meter).
 - - = Not sampled.
 - ND = Not detected above the noted detection limit.
 - (B) = Analyte was found in the associated field blank as well as in the sample.
 - Ambient (outdoor) sample collected outside of building.
 - EPA Target Value - Kindergarten Student = 0.100 µg/m3
 - EPA Target Value - Elementary School Student = 0.300 µg/m3
 - EPA Target Value - Adult = 0.450 µg/m3

Table 5 - PCB Air Analytical Data
Burke Elementary School
127 Birch Street, Peabody, Massachusetts

	Sample ID	Room 208	Outside	Field Blank	Field Blank	Field Blank	Field Blank
	Laboratory ID	11L0754-29	11L0754-30	11K0778-10	11L0754-31	12A0508-04	12B0521-06
	Sample Date	12/19/11	12/19/11	11/21/11	12/19/11	1/16/12	2/14/12
Monochlorobiphenyls	µg/m ³	0.035	ND (0.0014)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Dichlorobiphenyls	µg/m ³	0.031	ND (0.0014)	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0010)
Trichlorobiphenyls	µg/m ³	0.17	ND (0.0014)	ND (0.0010)	ND (0.0010)	0.028 (B)	ND (0.0010)
Tetrachlorobiphenyls	µg/m ³	0.14	ND (0.0027)	ND (0.0020)	ND (0.0020)	0.023 (B)	ND (0.0020)
Pentachlorobiphenyls	µg/m ³	0.035	ND (0.0027)	ND (0.0020)	ND (0.0020)	0.0088 (B)	ND (0.0020)
Hexachlorobiphenyls	µg/m ³	0.014	ND (0.0027)	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Heptachlorobiphenyls	µg/m ³	ND (0.0042)	ND (0.0041)	ND (0.0030)	ND (0.0030)	ND (0.0030)	ND (0.0030)
Octachlorobiphenyls	µg/m ³	ND (0.0042)	ND (0.0041)	ND (0.0030)	ND (0.0030)	ND (0.0030)	ND (0.0030)
Nonachlorobiphenyls	µg/m ³	ND (0.007)	ND (0.0068)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Decachlorobiphenyl	µg/m ³	ND (0.007)	ND (0.0068)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Total Polychlorinated Biphenyls	µg/m ³	0.43	ND (0.0068)	ND (0.0050)	ND (0.0050)	0.060 (B)	ND (0.0050)

Notes

- µg/m3 = microgram per cubic meter =
1,000 ng/m3 (nanograms per cubic meter).
- - = Not sampled.
- ND = Not detected above the noted
detection limit.
- (B) = Analyte was found in the associated field
blank as well as in the sample.
- Ambient (outdoor) sample collected outside
of building.
- EPA Target Value - Kindergarten Student =
0.100 µg/m3
- EPA Target Value - Elementary School Student =
0.300 µg/m3
- EPA Target Value - Adult =
0.450 µg/m3

Appendix A
Photo Log

PCB ANALYSIS SERVICES

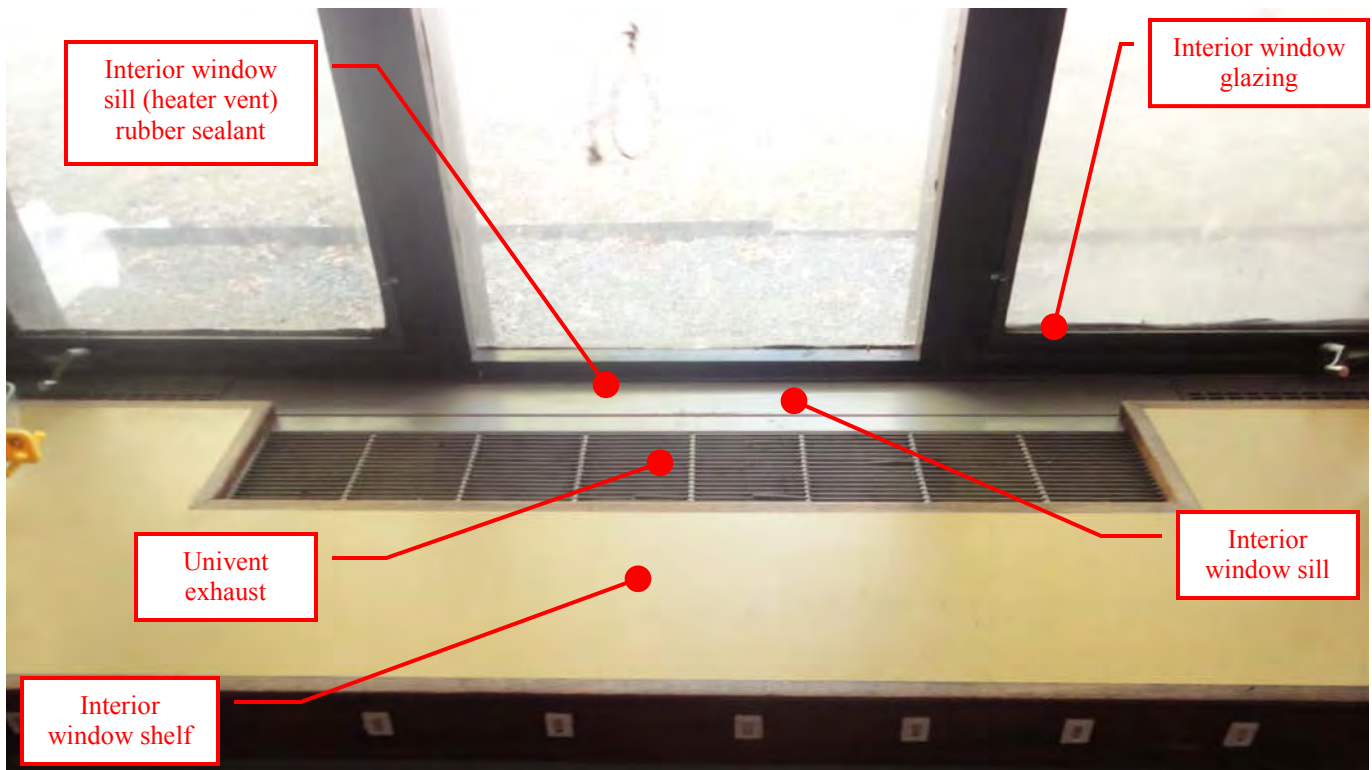
Burke Elementary School

127 Birch Street

Peabody, Massachusetts



Photograph 1: Typical classroom window setting.



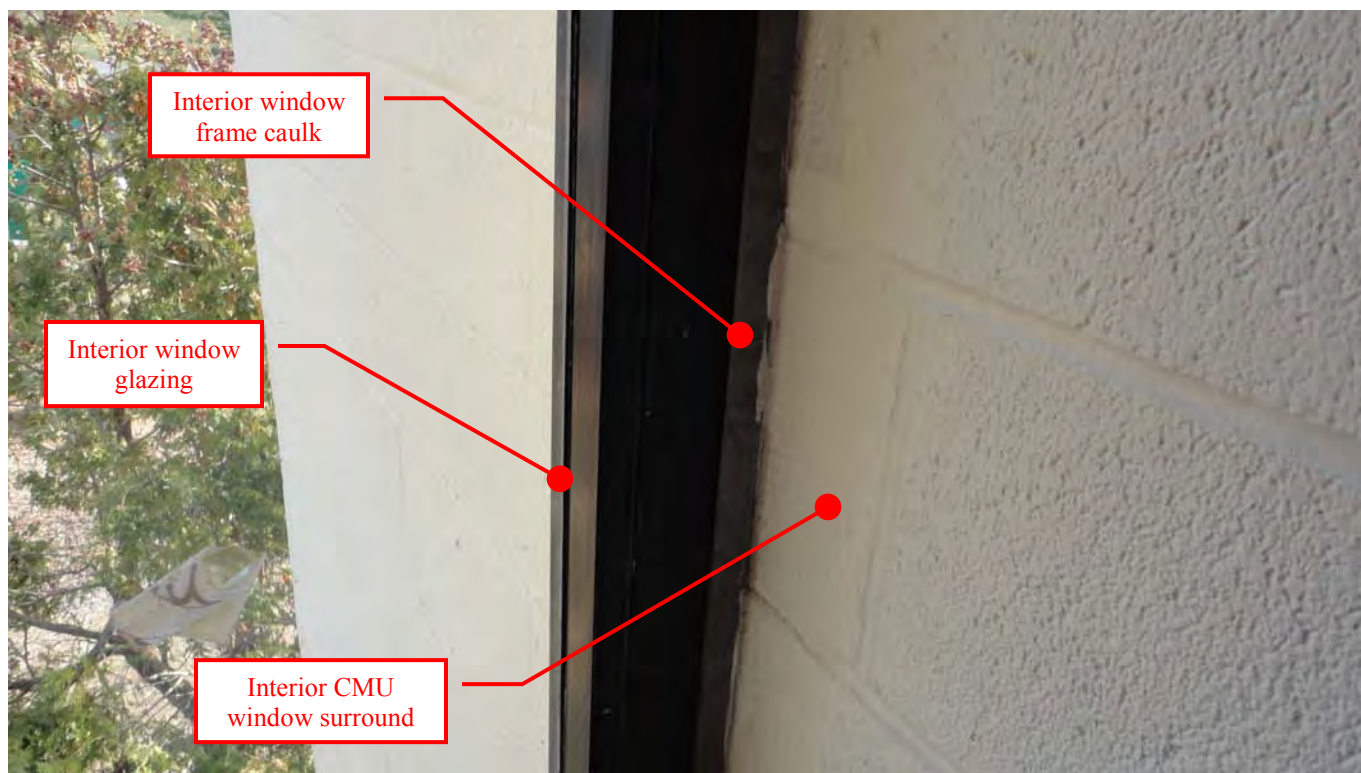
Photograph 2: Typical classroom window sill/shelf and vent.

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts



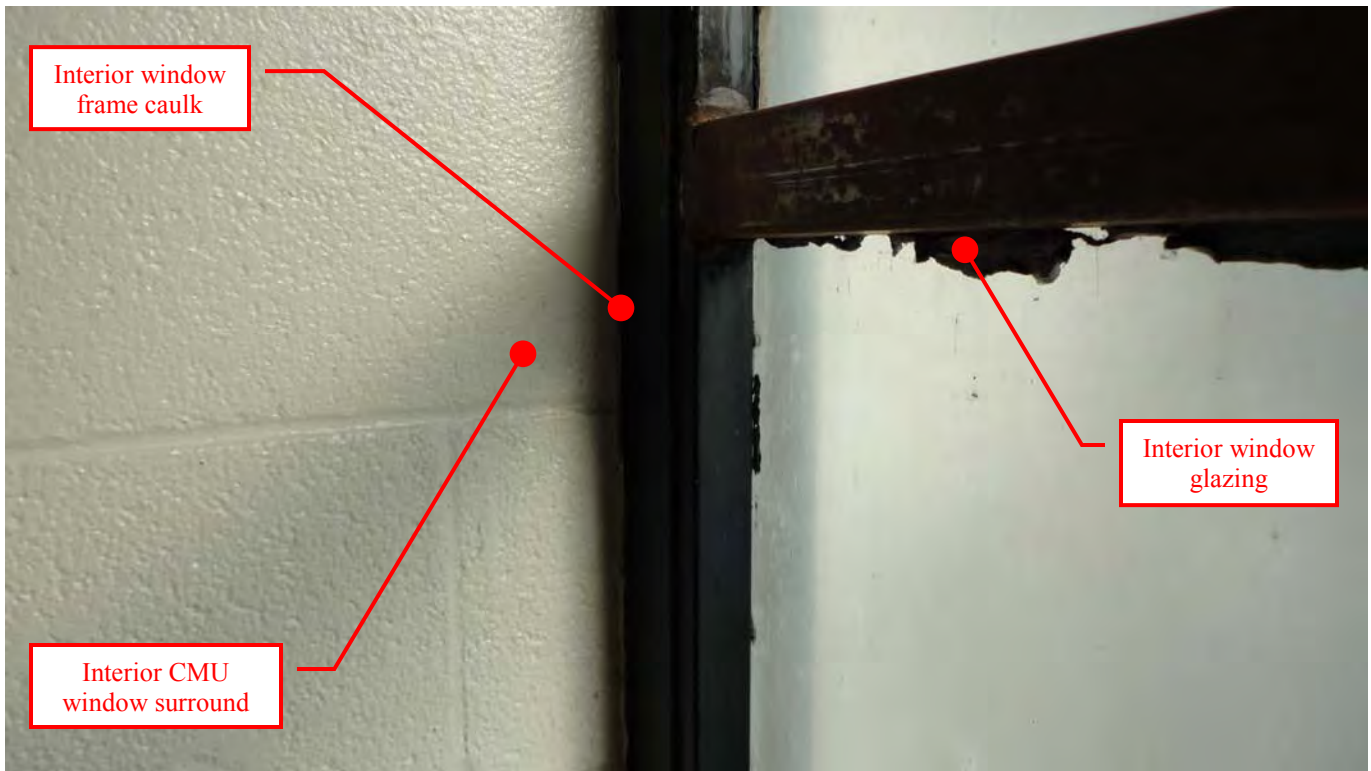
Photograph 3: Typical classroom window frame caulk (vertical joint); painted, rubber window sealant (horizontal joint) and metal sill.



Photograph 4: Typical classroom window frame caulk (vertical joint); unpainted.

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts



Photograph 5: Typical classroom window glazing (grey).



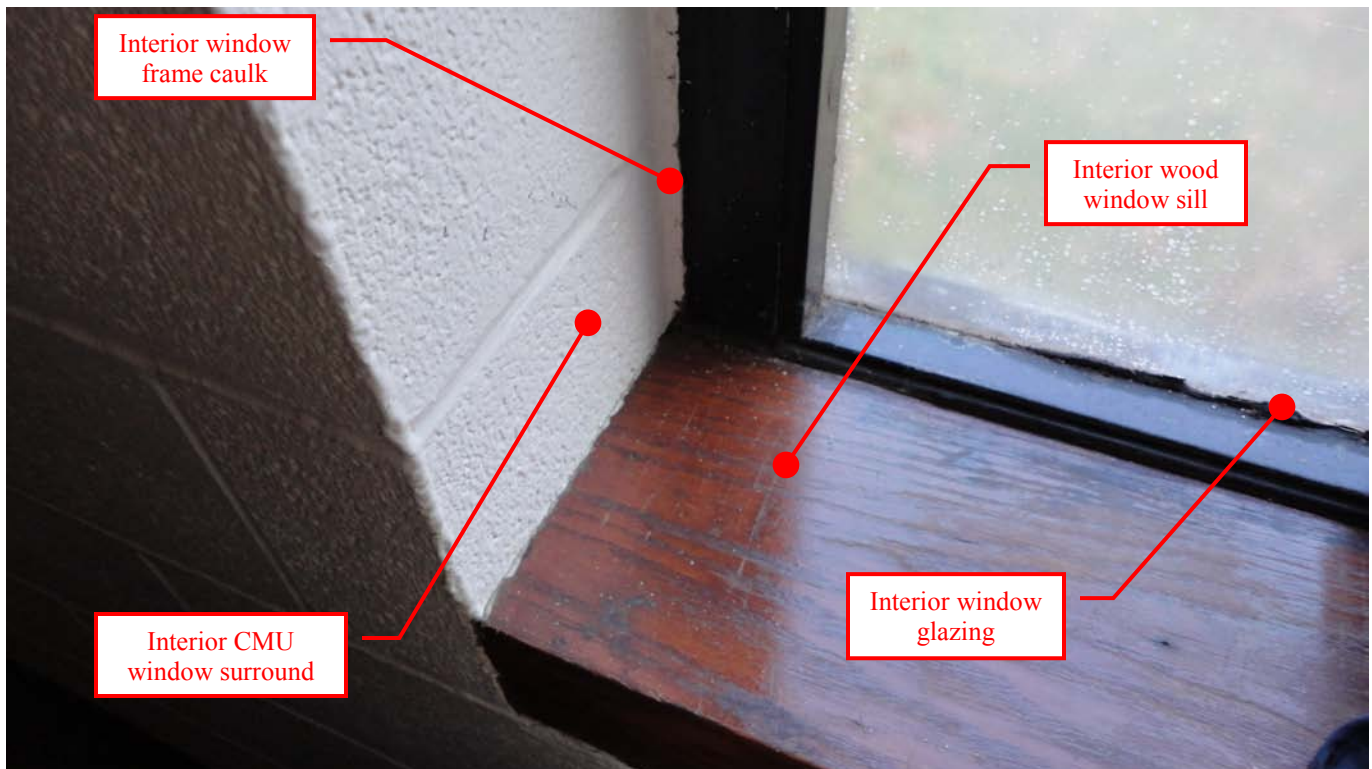
Photograph 6: Typical classroom window glazing (black).

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts



Photograph 7: Typical corner classroom window setting.



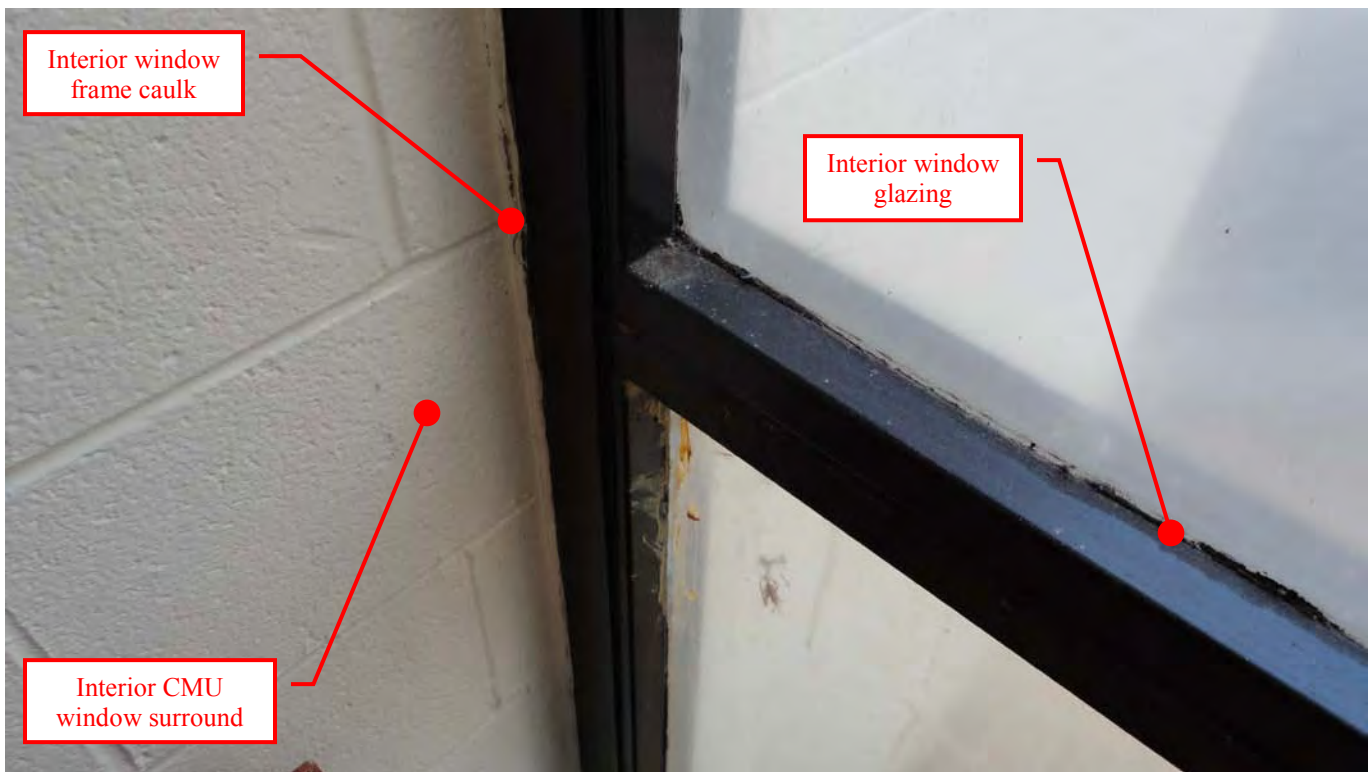
Photograph 8: Typical corner classroom window frame caulk (vertical joint), window glazing (black) and wooden sill.

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts



Photograph 9: Typical stairwell window setting.



Photograph 10: Typical stairwell window frame caulk (vertical joint) and window glazing.

PCB ANALYSIS SERVICES

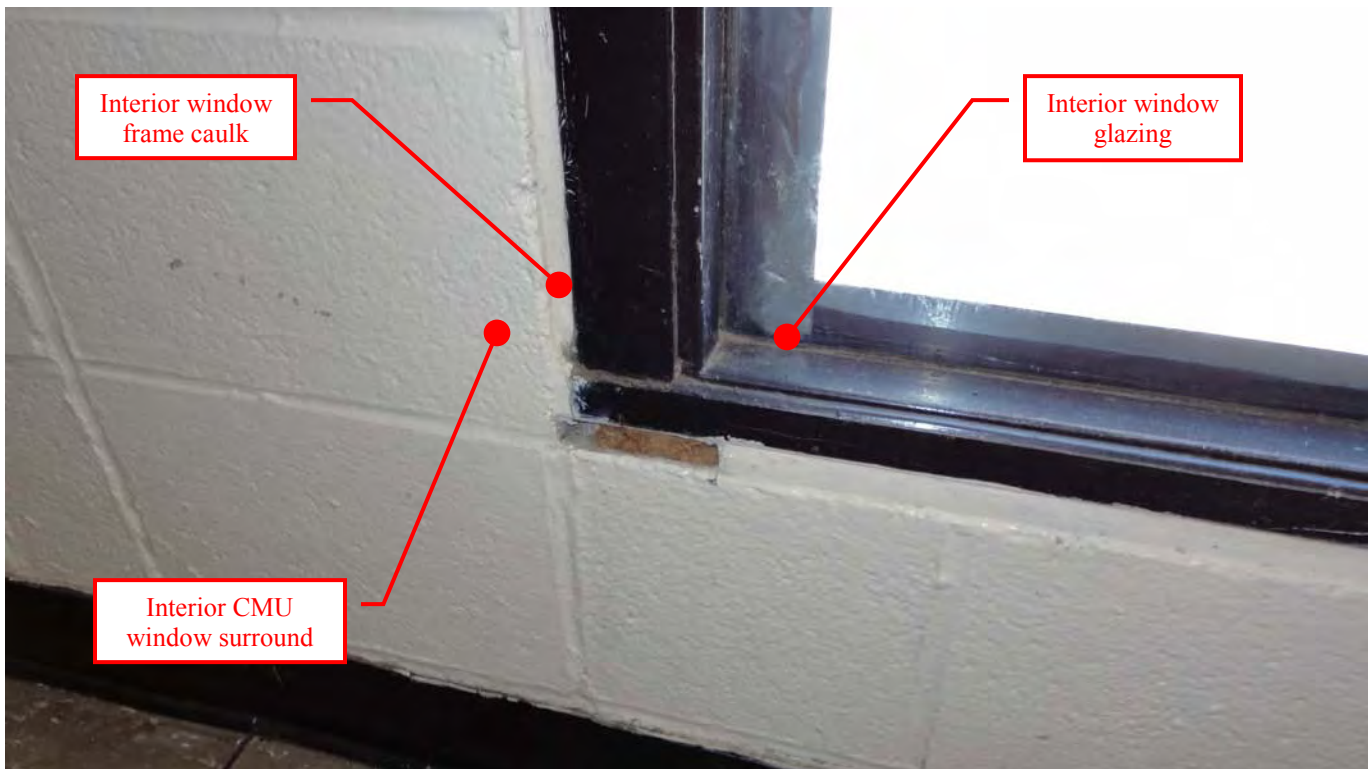
Burke Elementary School

127 Birch Street

Peabody, Massachusetts



Photograph 11: Typical hallway window setting.



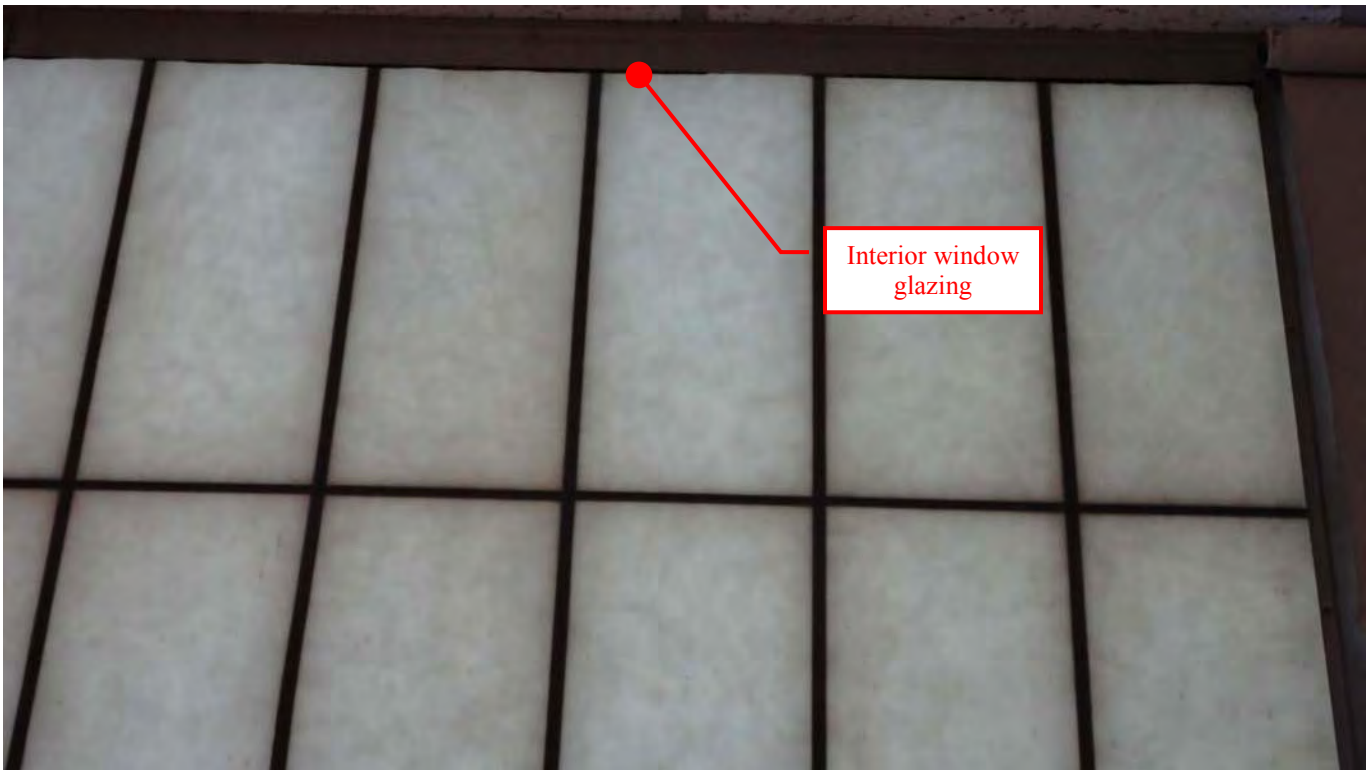
Photograph 12: Typical hallway window frame caulk (horizontal and vertical joint) and window glazing (black).

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts

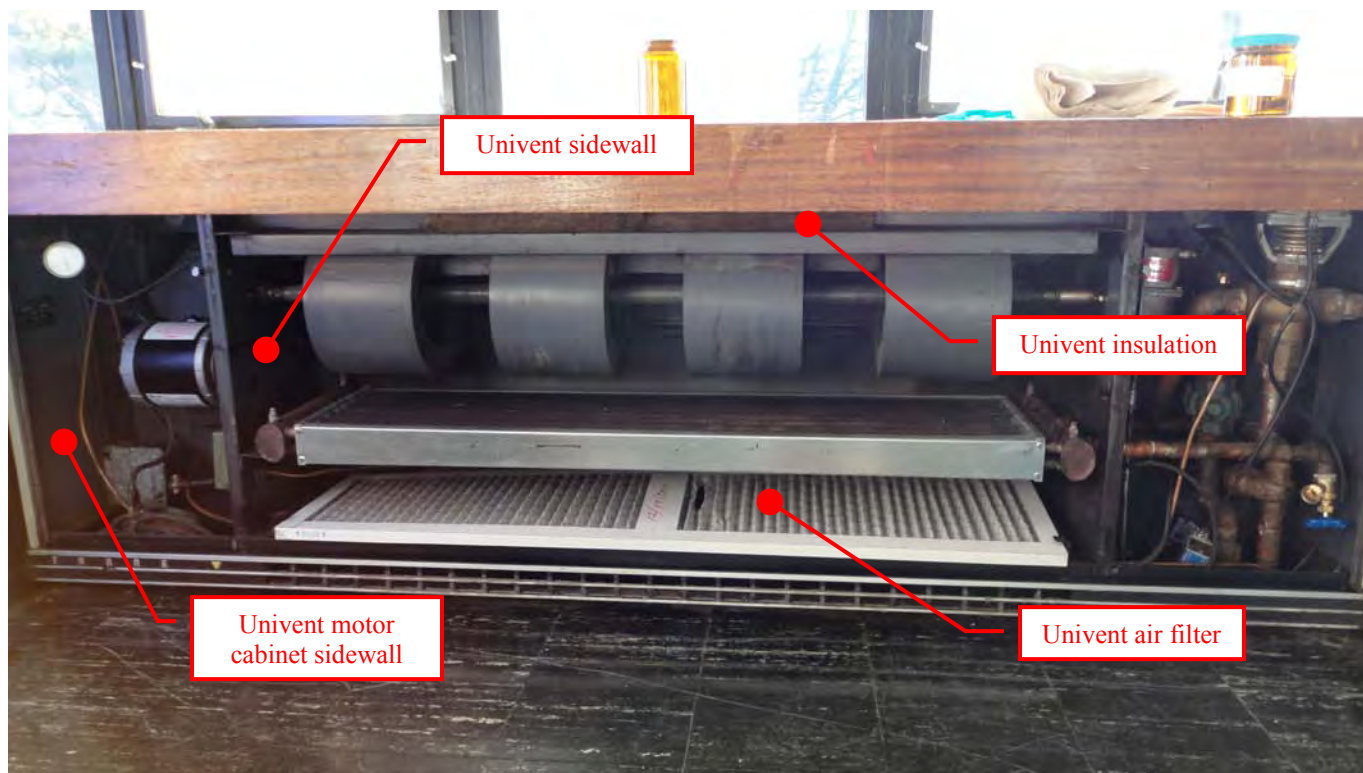


Photograph 13: Typical cafeteria and gymnasium window setting.



Photograph 14: Typical cafeteria and gymnasium window glazing (black).

PCB ANALYSIS SERVICES
Burke Elementary School
127 Birch Street
Peabody, Massachusetts



Photograph 15: Typical classroom univent interior.



Photograph 16: Typical classroom univent exhaust area.

PCB ANALYSIS SERVICES

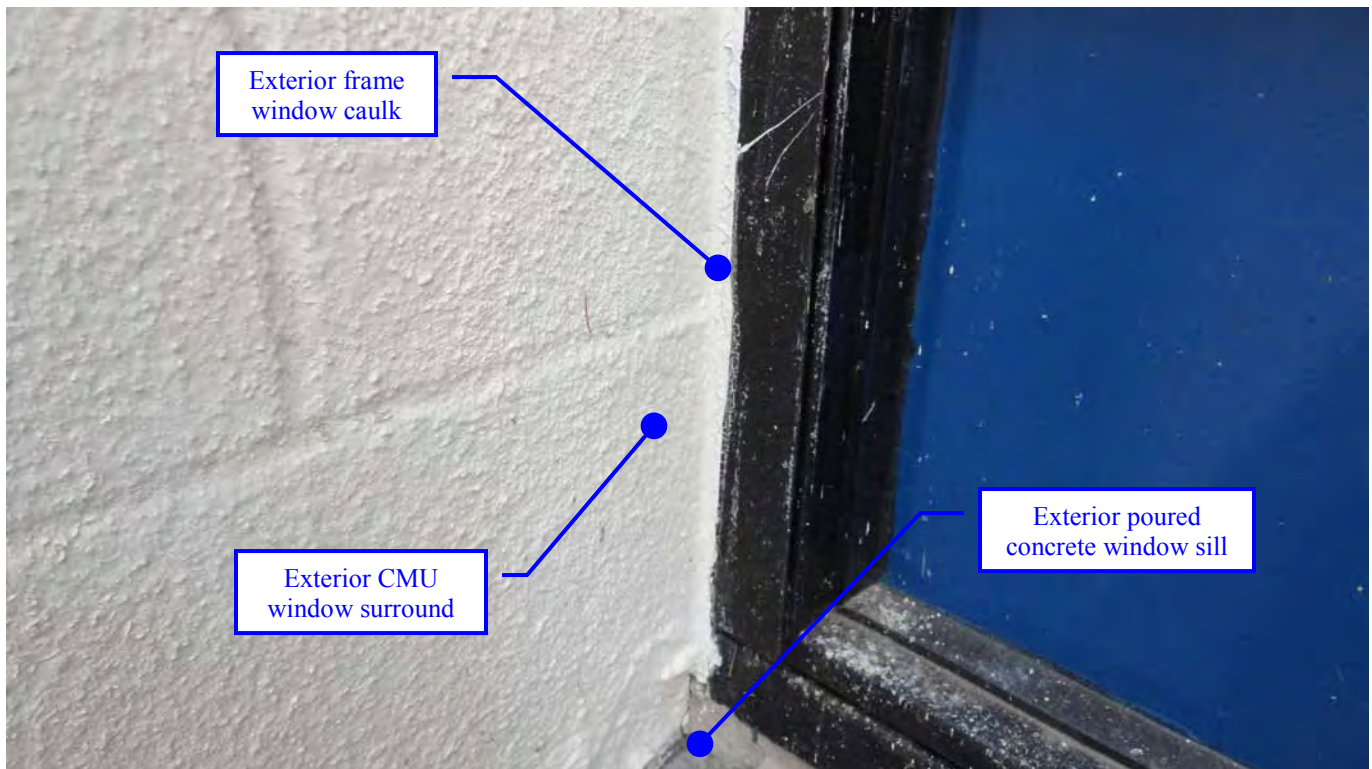
Burke Elementary School

127 Birch Street

Peabody, Massachusetts



Photograph 17: Typical classroom exterior window setting.



Photograph 18: Typical exterior window frame caulk (vertical joint).

PCB ANALYSIS SERVICES

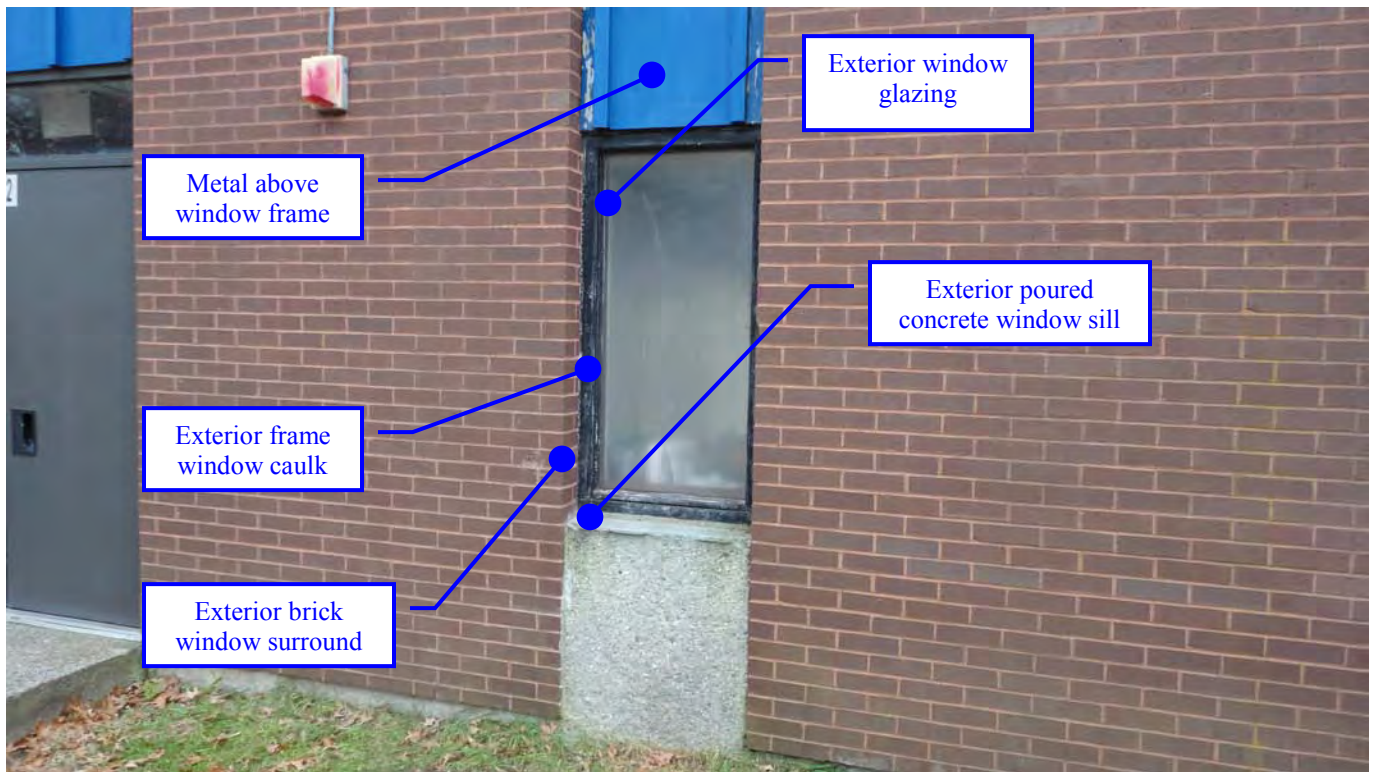
Burke Elementary School

127 Birch Street

Peabody, Massachusetts

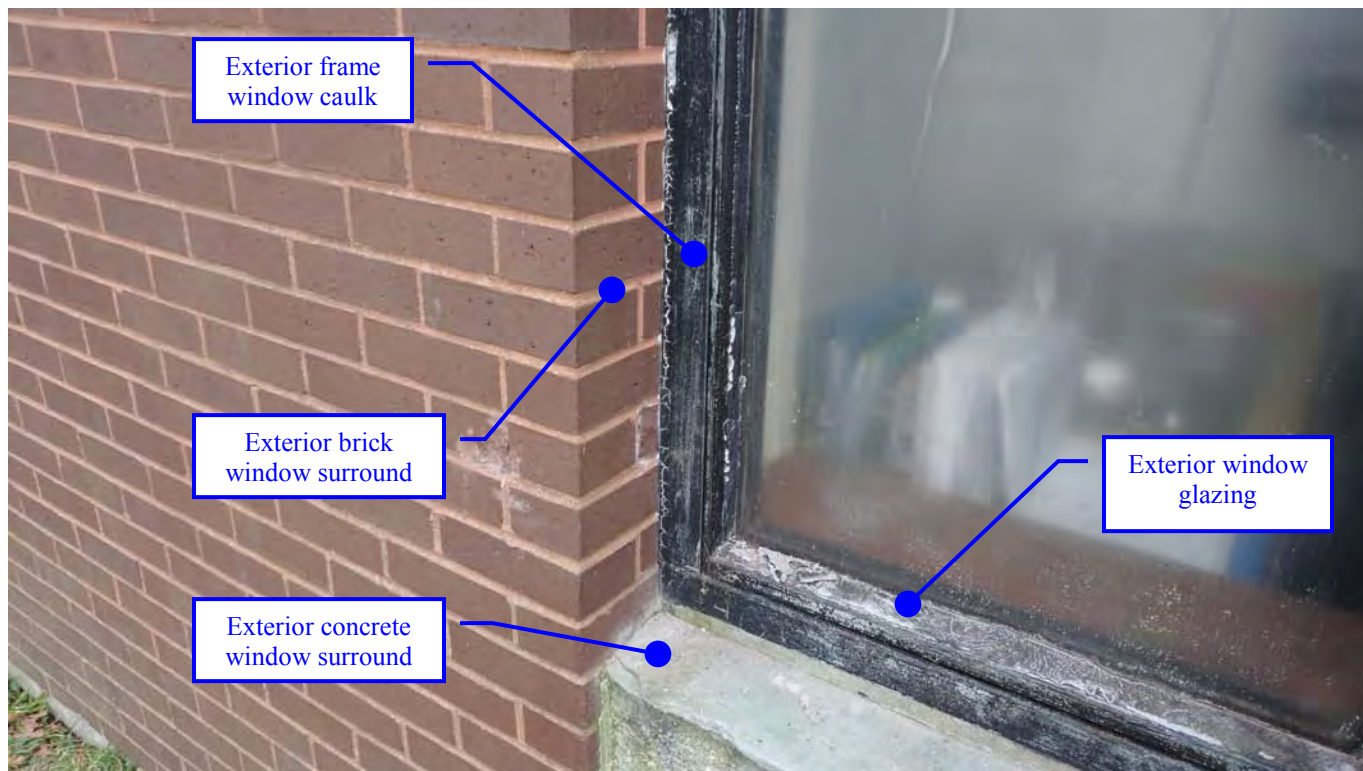


Photograph 19: Typical exterior window glazing (white).

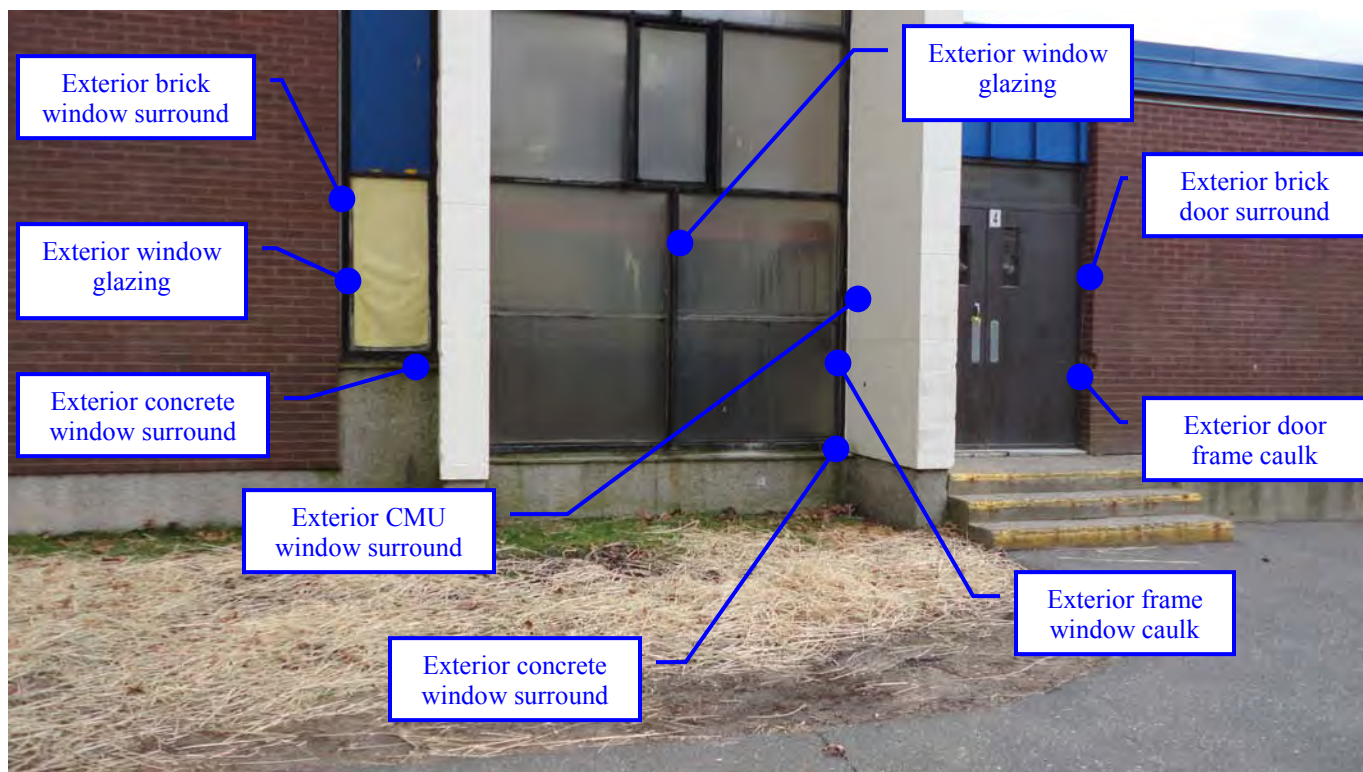


Photograph 20: Typical corner classroom exterior window setting.

PCB ANALYSIS SERVICES
Burke Elementary School
127 Birch Street
Peabody, Massachusetts



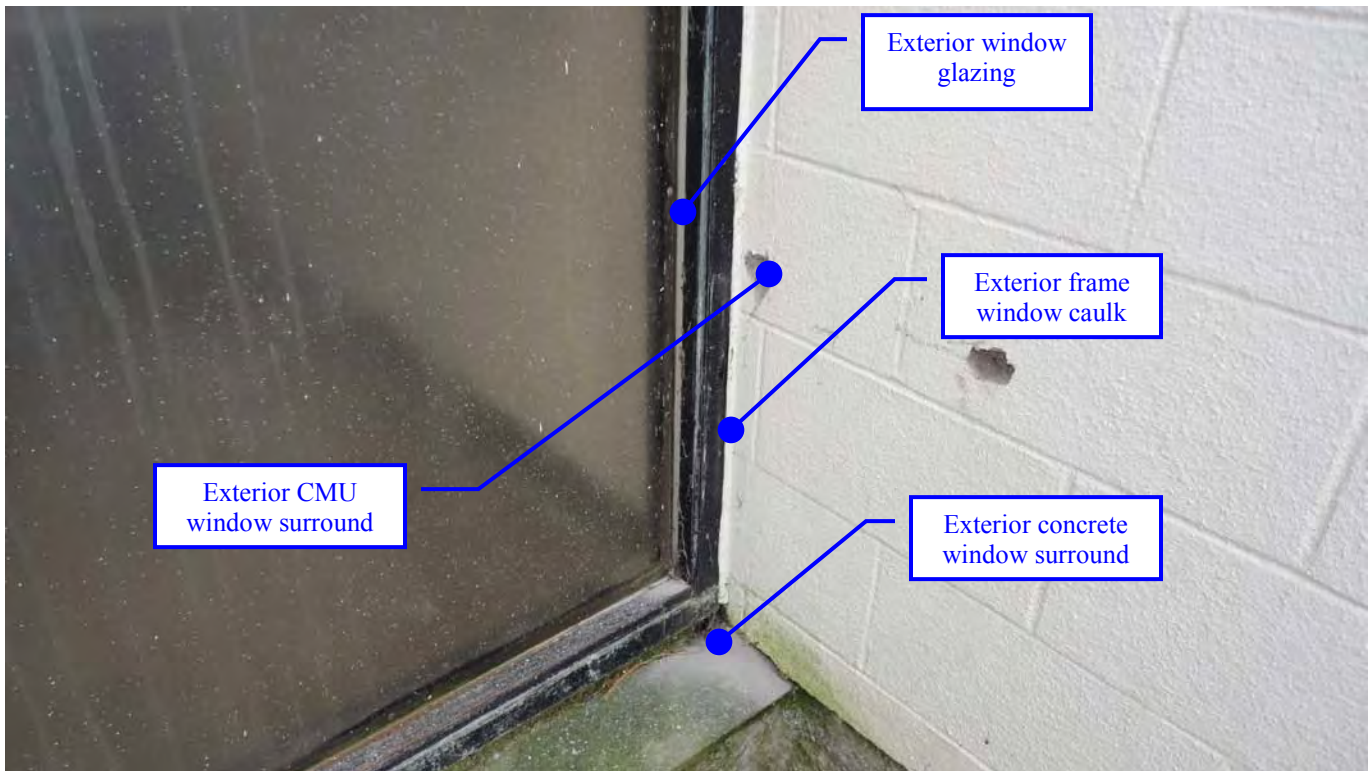
Photograph 21: Typical corner classroom exterior window frame caulk (vertical joint) and window glazing (white).



Photograph 22: Typical stairwell exterior window setting.

PCB ANALYSIS SERVICES

Burke Elementary School
127 Birch Street
Peabody, Massachusetts



Photograph 23: Typical exterior stairwell window frame caulk (vertical joint) and window glazing (gray).



Photograph 24: Typical hallway window setting with window frame caulk (vertical joint) and window glazing (grey).

PCB ANALYSIS SERVICES

Burke Elementary School

127 Birch Street

Peabody, Massachusetts



Photograph 25: Typical cafeteria and gymnasium exterior window setting.



Photograph 26: Typical cafeteria and gymnasium exterior large and small windows with window frame caulk (vertical joint) and various window glazing.

Appendix B

Laboratory Analytical Reports (on CD provided upon request)

SECTION 028433

REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Sampling has determined that polychlorinated biphenyls (PCBs) are present in select building materials, including at levels greater than or equal to \geq 50 ppm (parts per million).
- B. The removal and disposal of building materials with PCBs is regulated by the Toxic Substance Control Act (TSCA) pursuant to Code of Federal Regulations 40 CFR 761. Building materials with PCB concentrations \geq 50 ppm that are the source of the PCBs are regulated as PCB Bulk Product Waste. Building materials impacted by the PCB Bulk Product Waste with PCB concentration \geq 1 ppm are regulated as PCB Remediation Waste as defined by 40 CFR 761.3.
- C. This SECTION establishes requirements for the removal, segregation, management, and disposal of: (1) PCB Bulk Product Waste in the form of select sealants (window and door surround caulk and window glazing compound), (2) PCB Remediation Waste in the form of select sealants, masonry and other materials impacted by PCB Bulk Product Waste and associated debris, and Personal Protection equipment (PPE); and (3) Excluded PCB Product Waste. The Contractor shall furnish all labor, materials, services, training, insurance, and equipment as needed to complete removal of PCB containing materials and debris as indicated herein. The Contractor shall follow all Federal, State and local ordinances, regulations and rules pertaining to removal, storage, transportation and disposal of PCBs.
- D. The building contains PCB Bulk Product Waste that will be removed and disposed of in accordance with 40 CFR 761.62(a).
- E. The building contains PCB Remediation Waste that will be managed under a Risk-Based Disposal Plan in accordance with 40 CFR 761.61(c) and will either be removed and managed in accordance with 40 CFR 761.61(a)(5) or encapsulated with a coating or physical barrier.
- F. PCB Bulk Product Waste and associated PCB Remediation Waste have been identified to be managed under this SECTION based upon sampling performed through February 14, 2012. The attached PCB in Building Materials Evaluation Table provides a detailed data summary. These materials are associated with the windows, doors and storefronts within the limits of work as shown on the Drawings.

1. PCB Bulk Product Waste:

- a. Interior and exterior window surround caulk except for small gymnasium and cafeteria windows;
- b. Interior sealant between window and metal Univent heater and associated vent ("Window Sill at Univent Rubber Sealant");
- c. Interior window glazing compound except for small gymnasium and cafeteria windows; and
- d. Exterior door surround caulk.

John E. Burke Elementary School
Window Replacement
MSBA Green Repair Program
Peabody Public Schools

2. PCB Remediation Waste is any material with PCB concentrations ≥ 1 ppm or 1 microgram per 100 cubic centimeters ($\mu\text{g}/100\text{ cm}^3$) where the source of these PCBs is believed to be a PCB Bulk Product Waste:

- a. Exterior window glazing compound;
- b. Interior wooden window sills in rooms 101, 108, 109, 116, 201, and 208;
- c. Exterior poured concrete window sills;
- d. Interior and exterior painted CMU surrounds and interior poured concrete surfaces (within 1 foot of window caulk for the purposes of this Section);
- e. Interior and exterior wood trim in direct contact with window surround caulk;
- f. Exterior metal siding in direct contact with a window surround caulk;
- g. Filters and insulation associated with Univents;
- h. Exterior univent louvers;
- i. Concrete door thresholds to 6 inches from door surround caulk;
- j. Univent metal case and vents;
- k. Brick surround in direct contact with window surround caulk, except for cafeteria and gymnasium areas;
- l. Sill flashing in direct contact and within 1 foot of window caulk; and
- m. Interior window glazing compound and exterior window surround caulk at small gymnasium and cafeteria windows.

G. Excluded PCB Product Waste has not been identified based upon sampling performed through February 14, 2012. These materials will only be handled if required by the work of other SECTIONS. Their management is not covered by TSCA. This information is provided to support proper waste management and Contractor's Occupational Safety and Health Act (OSHA) worker right-to-know obligations.

H. The Contractor shall be responsible for verifying all quantity estimates in preparation of their bids, including the location and conditions of all PCB-containing materials to be abated and disposed of under this contract. No additional compensation and/or contract time shall be granted to the Contractor for failure to perform this requirement.

1.02 RELATED WORK

- A. SECTION 020800 – Asbestos Abatement: Some PCB-containing materials are also asbestos containing materials (ACM). The requirements for ACM work area containments and air clearance monitoring shall prevail.
- B. SECTION 024119 – Selective Demolition: For the removal and disposal of materials ancillary to the windows. The waste management in this SECTION shall prevail for all materials containing PCBs ≥ 1 ppm.
- C. SECTION 079200 – Joint Sealants: For the installation of new sealants. The requirements for surface preparation in this SECTION shall prevail.
- D. SECTION 099100 – Painting: For applying an encapsulant coating. The requirements for encapsulant performance and surface preparation in this SECTION shall prevail.

- E. SECTION 084500 – Translucent Assemblies: For the removal and installation of translucent window units. The requirements for waste management and installing fasteners into materials that are classified as PCB Remediation Waste presented in this SECTION shall prevail.
- F. SECTION 085113 – Aluminum Windows: For the removal and installation of window units. The requirements for waste management and installing fasteners into materials that are classified as PCB Remediation Waste presented in this SECTION shall prevail.
- G. When there is a conflict between SECTIONS the requirements of this SECTION shall prevail unless otherwise specified herein.

1.03 DEFINITIONS

- A. United States Environmental Protection Agency (EPA): Agency responsible for implementing PCBs Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions, 40 CFR 761 ("TSCA") Code of Federal Regulations (CFR).
- B. PCB Bulk Product Waste: Building materials (e.g. caulking and glazing) originally containing total PCBs at concentrations \geq than 50 ppm.
- C. PCB Cleanup Waste: Solid and liquid wastes generated during the cleanup of PCB Bulk Product Waste and PCB Remediation Waste.
- D. PCB Remediation Waste: Building materials with total PCB concentrations \geq 1 ppm or 1 $\mu\text{g}/100\text{ cm}^2$ that have become contaminated due to nearby PCB Bulk Product Waste.
- E. Excluded PCB Product: Building materials found to contain < 50 ppm total PCBs and not impacted by a PCB Bulk Product Waste put in service prior to 1984 and as defined in 40 CFR 761.3.
- F. Isolation Barriers: The construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off occupied workplace from surrounding areas and to contain PCB-containing dusts, liquids, materials, or debris in the work area.
- G. Uniform Hazardous Waste Manifest: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of PCB-containing waste material.

1.04 GENERAL REQUIREMENTS

- A. All PCB abatement work referenced herein shall be performed in accordance with a Health and Safety Plan (HASP) developed by the Contractor in accordance with OSHA regulations, including Hazardous Waste Operations and Emergency Response (HAZWOPER) or other approved equal standard, and any other applicable federal, state, or local regulations. All workers handling PCB-containing materials on-Site will be 40-hour HAZWOPER trained or other approved training.
- B. Worker Right to Know and Health and Safety Standards of 29 CFR 1926 shall apply to the work of this SECTION. Workers shall be informed of the PCB building components to be removed.
- C. Materials to be managed in accordance with this specification may also contain asbestos. The requirements for managing these contaminants is specified in SECTION 020800 in addition to those presented here.

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1. This specifically applies to health and safety, work zone containment, work zone posting and waste storage, shipping papers, transportation and disposal.
 2. When there is a conflict, the most stringent requirements shall apply.
 3. When there is a conflict between the above SECTIONS and this SECTION regarding surface preparation (e.g. etching, drilling, cutting, sanding, washing or other activities that will generate dust or building debris) and waste management, the requirements of this SECTION shall prevail. This specifically pertains to any activity related to the demolition, cleaning and/or disturbance of PCB Bulk Product Waste and PCB Remediation Waste.
- D. The Contractor shall provide all personnel with PPE, protective clothing, and monitoring equipment consistent with the levels of protection required for each type of work. Workers shall wear, at a minimum, ½-face respirators with P100 filters, water resistant Tyvek-type suits with boot covers, rubber gloves and eye protection when removing PCB Bulk Product Waste and PCB Remediation Waste unless a job specific exposure assessment is performed to demonstrate that a reduction in PPE is appropriate. All workers who will wear respirators must have Respiratory Protection training accordance with 29 CFR 1910.134.
- E. No chipping hammers, grinding or wire wheels will be used to remove PCB Bulk Product Waste or PCB Remediation Waste materials unless performed inside containment with HEPA attachments.
- F. All equipment and tools shall be provided to the Site free of contamination. The Owner prohibits any equipment from the Site that in his/her opinion has not been thoroughly decontaminated prior to arriving at the Site. Any decontamination of the Contractor's equipment prior to arrival at the Site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on Site which is not thoroughly decontaminated upon arrival.
- G. The work area will be demarcated with caution tape and signage at a distance to keep unauthorized workers and visitors out of the work area. A tool drop zone and personal decontamination facility will be established contiguous to the work zone. A clean zone will be established along with waste stream pathways.
- H. When working on the interior or exterior of the Site building, containments and/or regulated areas will be required to be established for removal and cleanup of the sealants and associated materials.
- I. The Contractor shall provide all drums, overpack drums, storage containers and related products, and materials required for collecting, storing, and transporting the PCB-containing waste in compliance with MassDEP, EPA, and U.S. Department of Transportation (DOT) requirements. All drums shall meet the requirements of DOT 49 CFR 173.
- J. Do not proceed with exterior PCB-containing material removal if contaminants are capable of being airborne due to high winds or mobilized by precipitation.
- 1.05 REGULATORY REQUIREMENTS
- A. The work of this SECTION shall meet the applicable waste removal and disposal requirements under 40 CFR 761, and in accordance with other applicable federal, state, and local regulations, laws, codes, and ordinances governing the removal, handling, transportation, and disposal of materials managed under this SECTION, including EPA requirements.
- B. The Contractor shall obtain all federal, state and local permits required for the removal, handling, transport and disposal of materials managed under this SECTION. The Contractor shall adhere to all permit requirements.

- C. The following regulations are cited for the information and guidance of the Contractor. The list below is not all-inclusive; the Contractor shall be responsible for a thorough knowledge and full implementation of all requirements for removal, transportation, and disposal of the materials managed under this SECTION.

1. "PCBs Manufacturing, Processing, Distribution in Commerce, And Use Prohibitions," 40 CFR 761 (TSCA).
2. "Hazardous Waste Operations and Emergency Response", Federal OSHA, 29 CFR 1910.120.
3. "Safety and Health Regulations for Construction", OSHA 29 CFR Part 1926.
4. "General Regulations for Hazardous Waste Management", EPA, 40 CFR 260.
5. "Regulations for Identifying Hazardous Waste, Hazardous Waste Generators and Hazardous Waste Transporters", EPA, 40 CFR 261, 262 and 263.
6. Regulations for Owners and Operators of Permitted Hazardous Waste Facilities", EPA, 40 CFR 264.
7. "Interim Status Standards for Owners and Operators of Permitted Hazardous Waste Facilities", EPA. 40 CFR 265.
8. "Standards for Management of Specific Hazardous Wastes and Facilities", EPA, 40 CFR 266.
9. "Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities", EPA, 40 CFR 267.
10. Hazardous Materials Regulations Relating to Transportation, 49 CFR 171-180 – U.S. DOT
11. Other Regulations Relating to Transportation, 49 CFR Subtitle B Parts 100-185 – U.S. DOT.
12. Publications, Practices for Respiratory Protection, z88.2-1992 - American National Standards Institute (ANSI).
13. Hazardous Waste Management, 310 CMR 30, Massachusetts Department of Environmental Protection (MassDEP).

- D. The following documents are cited for the information and guidance. The list below is not all-inclusive. The Contractor shall be responsible for a thorough knowledge and full implementation of all requirements for removal, transportation, and disposal of the materials managed under this SECTION.

1. Contractors Handling PCBs in Caulk During Renovation; EPA, EPA-747-F-09-004.
2. Preventing Exposures to PCBs in Caulking Material; EPA, EPA, 747-F-09-005 (September 2009).

1.06 SUBMITTALS

- A. The following submittals are required for review and approval by the Owner's Representative at least three weeks prior to mobilization:

1. Signed certification stating they have read and understand and will agree and abide by these Technical Specifications, and if available, the conditions specified in the EPA Work Plan for this project;
2. Laboratory Certification: All laboratories that will be performing PCB analysis for the Contractor must supply signed certification that their analytical procedures comply with the requirements of PCB analysis by EPA Method 8082 with soxhlet extraction by EPA Method 3540C;

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3. Site-specific HASP: Developed in accordance with OSHA regulations, including HAZWOPER or equivalent standard, and any other applicable federal, state, or local regulations;
 4. Licenses and Permits: Licenses and permits required for complying with any applicable federal, state and local laws, codes, policies and regulations in connection with the work outlined in this SECTION;
 5. Materials Product Data: Coatings and Paint Submit manufacturer's technical information including color, paint label analysis, and application instructions for each material proposed for use. Provide information demonstrating that the coating /paint is suitable for the substrate to be coated and meets performance requirements as indicated herein. Provide material safety data sheets; and
 6. Work Plan: Include all pertinent information relating to the work outlined in this SECTION.
 - a. Name(s), address(es), and contact(s) of subcontractors retained for the work outlined in this SECTION.
 - b. Detailed description of work activities and progress schedule for each phase of the work outlined in this SECTION.
 - c. Description of engineering controls and procedures used to minimize exposure to PCBs, and to mitigate migration of dusts and contaminants generated by work outlined in this SECTION.
 - d. Description of means and methods for removal and disposal of the PCB-containing materials.
 - e. Proposed methods of waste storage, disposal, and transportation.
 - f. Name(s), address(es), and contact(s) of hazardous waste transporter(s) that transport hazardous waste from the Site to a TSCA-approved disposal facility, including EPA identification number and proof of permit, license, or authorization to transport hazardous waste in all affected states.
 - g. Name(s), address(es), and contact(s) of disposal facility(ies), which accept materials containing < 50 ppm of PCBs, and greater \geq 50 ppm of PCBs, and a letter of acceptance indicating that the facility will accept removed materials associated with the work outlined in this SECTION.
- B. Waste Profiles: All waste profiles, applications and questionnaires, prior to forwarding them to the party requiring these documents;
- C. Letter of acceptance from waste management facility(ies) indicating that the facility will accept removed materials associated with the work outlined in this SECTION.
- D. Work Method Changes: Owner and Owner's Representative approval is required for all modifications to methods, procedures, and design, which may be proposed by the Contractor. Any such modifications or substitutions to methods, procedures, or design shall comply with applicable regulations. Contractor shall submit the proposed modification or substitution for review and approval.
- E. In addition to the items required by other sections of the Contract Documents, the following submittals are required for final payment:
1. Waste manifests or other documents required to transport and dispose of the items identified in this SECTION.
 2. Completion Report: Report that summarizes and documents the removal and disposal of all materials associated with activities outlined in this SECTION. This includes Certificates of Disposal for materials managed as PCB Bulk Product Wastes.

1.07 QUALITY ASSURANCE

- A. Remove PCB-containing sealants to allow for optimal adhesion of new sealants as applicable.
- B. Prepare surfaces for encapsulation for optimal adhesion of encapsulant.
- C. Owner's Representative will visually inspect areas of remediation to confirm adequate removal and have the opportunity to collect air samples, wipe samples and/or building material samples prior to installation of new materials or encapsulation.
- D. Owner's Representative may collect bulk samples from brick window and door surrounds for PCB analysis after installation of new windows and doors. Contractor shall not cover these sampled areas until results are received and direction is provided. Results will be available in 4 business days.
- E. Surface wipe sampling has shown that PCB concentrations on all non-porous surfaces are less than or equal to (\leq) $1.2 \mu\text{g}/100 \text{ cm}^2$ and porous surfaces $\leq 0.47 \mu\text{g}/100 \text{ cm}^2$. The Owner's Representative will collect random post-abatement wipe samples of remaining and porous and non-porous surfaces. If a sampled area is non-porous and has a result $> 1.2 \mu\text{g}/100 \text{ cm}^2$ or porous and has a result $> 0.47 \mu\text{g}/100 \text{ cm}^2$, the Contractor will have to clean and/or further encapsulate the area represented by the sample as appropriate at no charge to the Owner.
- F. If Contractor chooses to decontaminate non-porous materials, Contractor shall perform post-remedial wipe sampling of decontaminated materials. Wipe samples shall be collected in accordance with standard EPA protocols, which include using a one-time-use disposable template to outline a 100 cm^2 sample area and wiping the area one time across the full width of the sample area in each direction using a hexane-wetted gauze pad and moderate finger pressure. The wipe samples shall be collected from an area of the surface that was previously covered with a caulk/sealant. Samples shall be collected every 25 linear feet of non-porous material in contact with PCB Bulk Product Waste.

1.08 COORDINATION

- A. Extend full cooperation to the Owner in all matters involving the use of the Site and Owner's facilities. At no time shall the Contractor cause or allow to be caused conditions, which may cause risk or hazard to the general public, or conditions that might impair safe use of the Site.
- B. Provide Site access to the EPA, MassDEP, or Owner's Representative upon request.
- C. Provide access for inspection to all work areas by the Owner's Representative through all phases of the work. The Contractor shall provide all ladders, lifts (with trained operator) or other equipment necessary in order for the Owner's Representative to perform inspection, sampling and approval work as outlined by this SECTION.
- D. Owner will prepare work plans in accordance with 40 CFR 761 for EPA review and approval. This SECTION has been developed to reflect anticipated requirements of EPA approved work plans.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials and equipment proposed to be used on this project shall be subject to the acceptance of the Owner and Owner's Representative. The Contractor shall comply with local, state and federal regulations pertaining to the selection and use of materials and equipment on this project.
- B. Warning Signs and Labels: Work areas shall be properly demarcated and posted utilizing signs and labels in accordance with OSHA, TSCA, and U.S. DOT requirements.
- C. Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating four (4) or six (6) mil thickness.
- D. Tape (or equivalent) capable of sealing joints in adjacent polyethylene sheets and for the attachment of polyethylene sheets to finished or unfinished surfaces must be capable of adhering under both dry and wet conditions.
- E. Containers for storage, transportation and disposal of PCB-containing waste material shall be impermeable and watertight.
- F. Air filtration devices and vacuum units shall be equipped with HEPA filters.
- G. Coating/encapsulant shall be oleophobic and designed to adhere to the surface and not require recoating for at least 10-years. Coatings for all surfaces masonry shall be an elastomeric, epoxy or similar coating applied in at least two layers of contrasting colors. Refer to SECTION 08991000 – Painting for additional requirements.
- H. Air filtration devices: All air filtration devices shall be equipped with HEPA filters.
- I. Vacuum Cleaning Equipment: Equipment shall be industrial type designed for such use, equipped with HEPA filters. Separate dedicated vacuum cleaners shall be used for PCB remediation work and shall be clearly labeled as to their intended use. The equipment shall be properly operated at all times and shall contain no air leaks. Each vacuum cleaner shall be emptied and thoroughly cleaned (inside the work area) at the conclusion of the project, or each use.

PART 3 - EXECUTION

3.01 ABATEMENT OF PCB-CONTAINING MATERIALS

- A. The Contractor is informed that the renovation will involve the disturbance of building components that contain PCBs. The intent of this SECTION is to identify for the Contractor where PCBs have been confirmed to exist and the applicable regulatory responsibilities the Contractor shall comply with in order to perform the renovation/demolition work and remediation of contaminated building materials.
- B. This section summarizes the abatement approach. Contractor is responsible for selecting final means and methods. The removal of PCB Bulk Product Waste and management of PCB Remediation Waste shall be performed in accordance with the following minimal requirements.

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- C. All PCB Bulk Product Waste shall be removed and PCB Remediation Waste shown on the Drawings shall be managed in accordance with 40 CFR 761.
- D. Prior to disturbing PCB containing materials establish the following minimal controls:
 - 1. Install temporary fences, barriers or other controls around the active work areas to establish the "Construction Zone" and keep the public out;
 - 2. A "Regulated Area" shall then be established within the Construction Zone that demarcates the work area utilizing caution tape and appropriate signage;
 - 3. The "Regulated Area" shall be established at a sufficient distance to keep non-authorized personnel out of the work area;
 - 4. Polyethylene sheeting shall be placed on the ground and secured to the Site building;
 - 5. A remote decontamination unit shall be established directly adjacent to the "Regulated Area";
 - 6. When working on the building exteriors:
 - a. All doors, windows and/or vents located on the same side of the Site building and within fifty feet of where active abatement is taking place shall be closed. Vents shall be sealed with two (2) layers of six (6) mil polyethylene sheeting and duct tape;
 - b. All air conditioners and/or HVAC intakes located on the same side of the Site building and within 50 feet of where active abatement is taking place shall be shut off and sealed with six (6) mil polyethylene sheeting and duct tape;
 - c. Monitor interiors as work progresses. If based upon observations made as work progresses that dust is migrating to the Site building interior, work will be immediately suspended until corrective actions are implemented to control dust migration;
- E. When working on the building interior, a sealed barrier isolating the work area from the building interior constructed of polyethylene sheeting shall be installed around the interior work area in accordance with the requirements of SECTION 020800 – Asbestos Abatement. The enclosure shall remain in place until all asbestos containing materials and PCB containing materials to be removed have been removed and permission provided in accordance with SECTION 020800 – Asbestos Abatement.
- F. Remove sealant containing PCBs with hand tools, or power tools if under containment.
- G. Remove window and door systems and associated window and door surround sealants and interior sealant between window and metal heater. All materials will be managed as > 50 ppm PCB Bulk Product waste.
- H. Remove the following PCB Remediation Waste as required to install new window system and manage as > 50 ppm. Non-porous (metal and glass) materials may be decontaminated in accordance with 40 CFR 761.61(a)(5)(ii). Contractor shall be responsible for confirmation sampling if on-Site decontamination is performed.
 - 1. Interior wooden window sills in rooms 101, 108, 109, 116, 201 and 208;
 - 2. Interior and exterior wood trim in direct contact with window surround caulk;
 - 3. Exterior univent louvers;
 - 4. Filters and insulation associated with Univents. This item is part of Alternate 1;
and
 - 5. Sill flashing in direct contact and within 1 foot of window caulk.

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- J. All surfaces where PCB Bulk Product Waste sealants are removed and other areas identified herein shall be cleaned using HEPA vacuums and then double wiped with hexane (or other acceptable solvent) moistened cloths if not removed. This shall include:
1. Window and door surround masonry surfaces (CMU, poured concrete) within one foot of surround caulk on the interior and exterior side;
 2. Window and door brick surround within 6-inches from the window or door surround caulk except for cafeteria and gym;
 3. Exterior poured concrete window sills;
 4. Exterior metal siding in direct contact with a window surround caulk;
 5. Doors that are to be reinstalled;
 6. Outside the Univent metal case and lateral vents.
 - i. As Alternate 1: All internal accessible portions of Univent shall be cleaned so as to remove all visible oil, grease, grime and dust. All interior exterior metal surfaces shall be cleaned, this includes interior of lateral vents that emanate from Univent system;
 7. Removed cabinet system surfaces prior to reinstallation; and
 8. Sill flashing in direct contact and within 1 foot of window caulk.
- K. Remove all foreign material from abated areas that could interfere with adhesion of new sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), oil, grease, waterproofing, water repellents, water, surface dirt, and/or frost;
- L. An encapsulant will be applied to the painted CMU and interior poured concrete surfaces (if present) to one foot of either side of window surround caulk (interior and exterior). It shall consist of a double (or more) coating system in accordance with the following minimal requirements.
1. After removal of PCB Bulk Product prepare surface for coating by removing loose paint and debris. If power tools will be used to prepare surface or there is the potential to generate dust, work shall occur in a containment;
 2. If washing is required:
 - a. Wash with a vacuumed attached pressure washer with a minimum 800 PSI at 1.5 gallons per minute and maximum 4,000 PSI at 12 gallons per minute. The attachment to the washer shall use a shroud and vacuum to collect wash water and result in no visual emissions;
 - b. Washing shall only take place after the existing sealant has been removed and the authorization has been granted by the Owner. The purpose of the surface preparation is to remove dirt, oil, and other materials adhered to the masonry surfaces to properly prepare the surface for the coatings application;
 - c. A water tight catch basin shall be placed directly below the wash area as a secondary means of containment to control run off and over spray. The nearest down-gradient storm drain(s) (if any) shall also be covered using a flexible polyurethane drain cover to prevent wash water from entering the catch basin(s);
 - d. Water usage and pressure will be minimized to the extent practicable to eliminate mist/vapors/overspray. Washing will not be conducted in high winds or freezing temperatures. Furthermore, Site personnel will ensure that no residual wash water drains into the collection basin and that wash water does not puddle or accumulate outside the collection basin; and
 - e. The wash water will be stored in closed tanks or other approved container labeled as containing PCB wash water until disposal is arranged. Waste storage areas will be secured so that they are not accessible to the general public.

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- M. Exterior window sill flashing will extend over entire concrete poured sill to serve as the concrete sill encapsulant at some locations; painted encapsulation at other.
 - a. Concrete poured sill consists of a concrete parge (concrete “skim” coat) over a precast concrete member. If the parge is removed to facilitate the project, it shall be managed as PCB Remediation Waste. If power tools will be used to prepare surface, work shall occur in a manner that will control dust via using shrouded tools with HEPA vacuum dust collection or containment;
- N. All ground surfaces within the “Regulated Area” shall be cleaned of all sealant and associated debris. This shall include all sealant debris located on the ground prior to the start of the work as well as any material that was generated during the abatement;
- O. Prior to breakdown of interior enclosures Contractor shall vacuum all interior surfaces of the enclosure with a vacuum equipped with a HEPA filter. Final cleaning by the Contractor shall include removal of all contaminated material, equipment or debris (including PPE and containment materials) from the work area.
- P. Install new window systems: If it is required to drill holes into masonry surfaces to support setting new anchors where PCB Bulk Product Waste has been removed or material to be drilled into is identified as PCB Remediation Waste, drilling shall take place using tools equipped with shrouds and HEPA vacuum dust collection systems.
- Q. All removed sealants and associated debris shall be placed in double six (6) mil disposal bags and transported to the Waste Storage area for disposal. All wastes shall be removed from the Construction Zone at the end of each work shift;
- R. All disposable tools, PPE, polyethylene sheeting and other materials shall be placed in six (6) mil disposal bags and transported to the Waste Storage area. All wastes shall be removed from the Construction Zone at the end of each work shift;
- S. Upon completion of the abatement, a visual inspection shall be performed by the Owner’s Representative to ensure all PCB-containing sealant and associated debris has been properly removed and surfaces prepared for coating, as applicable. The Owner’s Representative shall have the opportunity to collect building material samples as required by the EPA;
- T. Proceed with work only after unsatisfactory conditions have been corrected.
- U. Manage all wastes generated in accordance with 40 CFR 761, as detailed in Article 3.03 herein.

3.02 COATING APPLICATION

- A. A coating/encapsulant will be applied to the painted interior and exterior CMU and interior poured concrete surfaces to one foot of either side of window surround caulk (interior and exterior) after adjacent PCB Bulk Product Waste is removed and surface prepared.
- B. After surface preparation, the additional PPE and training for handling PCB containing wastes is not required.
- C. The coating shall be oleophobic and designed to adhere to the surface and not require recoating for at least 10-years.

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- D. Coatings for all surfaces masonry shall be an elastomeric, epoxy or similar coating applied in at least two layers of contrasting colors.
- E. If a clear sealant is required, it shall be applied in multiple applications until the product is observed to bead.
- F. Performance: Once coating/encapsulant has cured, the Owner will collect representative wipe samples for PCB laboratory analysis. If a result is $> 1 \mu\text{g}/100 \text{ cm}^2$, the area represented by the sample will be washed and the top coat re-applied in accordance with SECTION 099100 – Painting.
- G. Refer to SECTION 099100 – Painting for additional coating requirements.

3.03 WASTE MANAGEMENT

- A. All waste management will be in accordance with applicable local, state and federal regulations. All costs associated with handling, transport and disposal of all waste material generated on this project shall be borne by the Contractor.
- B. The Contractor is responsible for ensuring that all wastes are reduced in size to meet final waste disposal facility requirements and obtaining additional data that the waste disposal facility may require to accept waste, except as noted in this SECTION.
- C. The wastes generated during the work shall be classified as follows:
 - 1. PCB Bulk Product Waste: All wastes known or assumed to have PCB content ≥ 50 ppm. Includes all materials identified as PCB Bulk Product Waste, all PPE, containment materials and tools used during the abatement that are not decontaminated, all debris generated during preparation of areas identified as PCB Remediation Waste for coating, and if removed, materials identified as PCB Remediation Waste.
 - a. Some materials also contain asbestos, as detailed in SECTION 028000 – Asbestos Abatement. Refer to SECTION 028000 – Asbestos Abatement for associated work requirements.
 - b. Waste containers shall be placarded as containing PCB Waste with markings meeting the EPA requirements of 40 CFR 761.40 and 761.45.
 - c. These wastes shall be disposed of in accordance with 40 CFR 761.62 at a licensed facility that will receive and retain PCB Bulk Product Waste.
 - 2. PPE and Containment Material can be managed in accordance with 40 CFR 761.61(a)(5)(v).
 - a. Wastes shall be properly containerized. Containers for this waste shall be labeled per 40 CFR 761.61 and 761.79 as “Non-DOT, Non-RCRA Regulated Material.”
 - b. These wastes shall be disposed of in accordance with 40 CFR 761.79(g)(6) at a permitted facility meeting the requirements of 40 CFR 761.61(b).
 - 3. Decontamination and Wash Water. Any generated liquids determined to contain PCBs at > 0.5 parts per billion (ppb), or not sampled, will be transported off-Site for decontamination to meet the requirements in 40 CFR 761.61(a)(4)(iv). There is no separate pay item for water management.

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2. Excluded PCB Product: This material may be managed by any permitted waste management facility as long as they are made aware of PCB levels in the materials they are to receive and their permit allows them to accept these types of materials. Note that some materials also contain asbestos.
- D. Non-PCB containing materials shall be kept separate from PCB-containing materials. With the exception that Excluded PCB Product can be comingled with demolition debris if the above requirements are met.
 - E. All tools and equipment that cannot be decontaminated with a double wipe with a solvent wetted rag in accordance with 40 CFR 761.79(c) shall be managed in accordance with the waste category they were used for.

3.04 WASTE STORAGE

- A. A secure fenced area with proper signage will be constructed around the Waste Storage Area to restrict public access.
 1. Waste container(s) shall be stored in accordance with 761.65(c) and labeled in accordance with CFR 761.40. Access to containers shall be controlled via a fixed tarp.
 2. When not in use, containers shall be closed by means to prevent water infiltration when not being loaded.
 3. All waste containers shall be within a secured locked fenced area.
 4. All solid waste containers shall be placed on-site at a location approved by the Owner. This area shall be placarded as containing PCB Waste with markings meeting the EPA requirements of 40 CFR 761.40 and 761.45.

3.05 SHIPPING PAPERS

- A. A Uniform Hazardous Waste Manifest is required for removal from the premises, and disposal of materials categorized as PCB Bulk Product Waste and PCB Remediation Waste known or assumed to contain ≥ 50 ppm PCBs in SECTION 3.03, unless an exemption from this required is obtained from the Massachusetts Department of Environmental Protection.
 1. Each manifest, bill of lading, or other applicable documentation, shall note the truck registration number, state of registration, name of driver, and date of removal of material from the site.
 2. The Contractor shall comply with the RCRA Hazardous Waste Manifest policies and is responsible for obtaining a temporary EPA Identification Number for the site. This includes providing a landline telephone number in accordance with the RCRA regulations. One EPA Identification Number shall be used for all hazardous waste management associated with this SECTION.
 3. The Owner will be designated as Generator and will sign all manifests and waste profile applications or questionnaires.
- B. All other materials shall be shipped under a straight bill of lading.

- C. The presence of asbestos and/or lead based paint in a waste may lead to more stringent shipping paper requirements. Refer to appropriate SECTIONS for these materials shipping paper requirements.
- D. A copy of all shipping papers demonstrating waste's final disposition shall be provided to the Owner.

3.06 TRANSPORT OF CONTAMINATED MATERIAL

- A. No contaminated materials shall be transported off-site until all disposal facility documentation has been received, reviewed, and accepted by the Owner.
- B. All hauler(s) shall be licensed in all states affected by transport.
- C. The Contractor shall be responsible for inspecting the access routes for road conditions, overhead clearance, and weight restrictions, and shall provide traffic control when needed.
- D. The Contractor shall be responsible for any and all actions and costs necessary to remedy situations involving material spilled in transit or debris, mud and dust tracked off-Site. This cleanup and other ancillary activities shall be accomplished at the Contractor's expense.
- E. Trucks and containers shall be covered during transport as required by applicable law.

3.07 SPILL RESPONSIBILITY

- A. The Contractor is solely responsible for any and all spills or leaks during the performance of work under this contract, which occur as a result of or are contributed to by the actions of its agents, employees or subcontractors. Such spills or leaks shall be cleaned to the satisfaction of the Owner or its representative, and in a manner that complies with applicable federal, state and local laws, codes, policies and regulations. The spill cleanup shall be at no cost to the Owner.
- B. The Contractor shall report all such spills or leaks, regardless of their quantity, to the Owner immediately upon discovery. A written follow-up report shall be submitted to the Owner as soon as possible, but not later than 24 hours after the initial telephone report. The written report shall be in narrative form and, at a minimum, include the following:
 - 1. Description of item spilled (including identity, quantity, manifest number, etc.);
 - 2. Exact time and location of spill, including a description of the area involved;
 - 3. Containment procedures initiated; and
 - 4. Description of cleanup procedures employed or to be employed, including location of disposal of spill residues, and corrective measures to prevent recurrences.

3.08 DECONTAMINATION PROCEDURES

- A. General: Furnish labor, materials, tools, and equipment for decontamination of all personnel, equipment and supplies that enter the contaminated work area or are exposed to contaminated material. Provide equipment and decontamination pads, etc. necessary for the decontamination of equipment and personnel.
- B. Materials that contain PCBs shall meet the decontamination requirements specified herein.

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- C. Equipment and Tools Decontamination: The decontamination procedure shall follow the requirements of 40 CFR 761.79(c) (2), decontamination via a wiping or double wash/rinse with an approved solvent. Equipment and tools that cannot be decontaminated will be managed as:
1. Contaminated materials with PCBs < 50 ppm if all sludges within or adhered to equipment or tool, dusts and bulk sealant material is removed; and
 2. Containing PCBs \geq 50 ppm if all sludges within or adhered to equipment or tool, dusts and bulk sealant material cannot be removed.
- D. Personnel Decontamination: Provide and maintain a decontamination area which is to be located in the contamination reduction zone. Coordinate the location of the decontamination area with the Owner's Representative. Decontamination of personnel and equipment is required after performance of activities in the exclusion zone. The personnel decontamination area may be in the form of a mobile trailer or field station. Personnel decontamination shall, at a minimum, consist of: decontamination before breaks and each time workers exit the exclusion zone, and at the completion of each work day to prevent worker exposure and the spread of contaminants off site.
- E. Emergency Decontamination: Should a worker be splashed with contaminants, the worker shall be immediately escorted to the field decontamination station and decontaminated in accordance with the HASP. Site eye wash and shower stations shall be made available and operable.

END OF SECTION

SECTION 02 08 00

ASBESTOS ABATEMENT AND RELATED WORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The Drawings, General and Supplementary Conditions of the Contract and other Division 1 General Requirements apply to the work of this section.
- B. Examine all drawings and all other Sections of the Specifications for requirements therein affecting the work of this Section.

1.02 OVERVIEW OF WORK

- A. The work of this Section includes proper removal and disposal of asbestos-containing and asbestos-contaminated materials (ACM) in conjunction with the window replacement project at the John E. Burke Elementary School, Peabody, Massachusetts. Note that caulk to be removed as part of work of the Section contains Polychlorinated Biphenyls (PCBs) greater than 50 ppm. Refer to Section 028433 Removal and Disposal of Polychlorinated Biphenyls for additional removal and waste disposal requirements.
- B. Pre-Abatement activities, including attendance at a pre-construction meeting, site inspection, notifications, permits, submittals, health and safety plan and standard operating procedures are included in this Section.
- C. Abatement activities including removal and disposal of ACM and mixed ACM/PCB waste, recordkeeping, security, inspection and monitoring are included in this Section.

1.03 WORK TO BE PERFORMED

- A. The Contractor shall remove and dispose of all ACM associated with the window replacement project. Furnish all labor, materials, facilities, equipment, services, disposal, employee training and testing, permits, and agreements necessary to perform the work required for removal of ACM in accordance with these specifications, EPA, OSHA and DOT regulations, NIOSH recommendations, Massachusetts DEP and DLS requirements, City of Peabody, any other applicable federal, state, and local government regulations and guidelines. Whenever there is a conflict among regulations, the strictest provisions shall prevail. The Owner's Representative must approve deviations from this specification in writing.
- B. The Contractor shall remove and dispose of the following as ACM:
 - 1. Acoustical ceiling tile adjacent to all locations where windows and doors will be removed. Work shall include removal and disposal of two rows of ceiling tile and associated suspension system for the entire length of the window or door, temporary support of remaining ceiling system, removal and disposal of decorative 1-inch strips of ceiling tile and associated 1" x 6" redwood trim boards in classrooms. Refer to Drawing D0.1 Reflected Ceiling Demolition Plans for ceiling removal locations. Removal shall be performed within negative pressure, full-containment work areas, equipped with 3-stage decontamination unit with an operable shower.
 - 2. Removal and disposal of existing door frames, window units, spandrel panels, mullions, framing, fasteners, blocking and trim, and residual caulk from door and window frames and masonry openings as asbestos-containing material. All materials shall be removed as ACM. Note – door and window frame caulk contains PCB's. Refer to Section 028433

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Removal and Disposal of Polychlorinated Biphenyls for additional removal and waste disposal requirements. Refer to Demolition Elevation Drawings for identification of doors and windows to be removed. All door and window removal shall be performed from the exterior of the building.

- C. Provide all necessary lifts, scaffolding and fall protection to perform the work.
- D. HEPA-vacuuuming and wet cleaning of all surfaces within the regulated asbestos work areas.
- E. Installation of all temporary lighting, water, electrical connections, etc., as required for asbestos abatement. Coordinate temporary electrical and plumbing connections with the General Contractor.
- F. Filing of all notifications and permits as required for the work to be performed. All costs associated with required notifications and permits shall be paid for by the Contractor and included in bid price.
- G. Provide work area preparations as specified by these specifications and all applicable regulations.
- H. Provide worker training, respiratory protection and medical examination.
- I. Repair or restoration of damage to interior finishes and the grounds to their original condition, resulting from work of the Contract.
- J. Submit copies of completed Waste Shipment Records to the Owner within 30 days of asbestos-containing waste leaving the site.
- K. Packing, labeling, transporting and disposal of asbestos-containing and asbestos-contaminated materials in an approved landfill. All wood and metal debris produced as a result of the Contractor's work shall be sealed in appropriate leak tight containers sufficient to prevent leakage due to cuts, puncture, tears, etc.

1.04 CONTRACTOR QUALIFICATIONS

- A. The Contractor shall be licensed by the Massachusetts Department of Labor Standards (DLS) as an Asbestos Contractor.
- B. The Contractor shall be certified by the Massachusetts Division of Capital Asset Management (DCAM) to perform asbestos abatement projects of this size and nature. Submit a copy of the Contractor's Certificate of Eligibility, Form CQ7 and Contractor Update Statement, Form CQ3 with bid.
- C. The Contractor shall purchase and maintain insurance coverage listed with respect to the operations and completed operations of this Project. All policies shall be written on an occurrence basis, by companies authorized to write the type of insurance in Massachusetts. Contractor shall submit a certificate of insurance acceptable to the Owner. Certificates shall show the Owner as an additional insured.
- D. All personnel of the Contractor or any approved subcontractors involved with asbestos abatement work shall meet the following minimum qualifications:
 - 1. Current certification by the MA DLS as an asbestos supervisor or asbestos worker.
 - 2. Medical examination within the past year in accordance with OSHA 1926.1101 with a physician's written opinion that the worker has no condition that would preclude him/her from working with asbestos or wearing a respirator.

- E. The Contractor shall employ a Competent Person to oversee all aspects of ACM removal. The Competent Person qualifications shall be as follows: minimum of four (4) years of abatement experience of which two (2) years were as the Competent Person; meets the OSHA definition of a Competent Person; has been the Competent Person on two (2) projects of similar size and complexity as this project; has completed EPA AHERA/OSHA/State training requirements/accreditation(s) and refreshers; and has all required OSHA documentation related to medical and respiratory protection.
- F. There shall be a sufficient number of trained and qualified workers, foremen and superintendents to accomplish the work within the required schedule. No untrained nor fully qualified and pre-approved person shall be employed to speed up completion of the abatement work.
- G. Refer to Section 028433 for additional worker qualifications and training requirements.

1.05 SCHEDULING

- A. The Contractor shall prepare an abatement schedule for submission to the Owner at the Pre-Construction Conference.
- B. The Contractor shall update the abatement schedule on a weekly basis.

1.06 PERIOD OF PERFORMANCE

- A. The Contractor shall complete all work of this Section including completion of all punchlist items within the time period indicated in the Contract Documents.

1.07 AUTHORITY TO STOP WORK

- A. If the Owner or the Owner's Representative presents a written Stop Asbestos Removal Order, the Contractor shall immediately stop all asbestos removal and adequately wet any exposed ACM with amended water. The Contractor shall not resume any asbestos removal activity until authorized to do so by the Owner or the Owner's Representative. A stop asbestos removal order may be issued at any time the Owner or the Owner's Representative determines abatement conditions/activities are not within specification requirements. Work stoppage will continue until conditions have been corrected to the satisfaction of the Owner or the Owner's Representative. The Contractor shall pay standby time and costs for corrective actions.
- B. Stop work orders may be issued for, but may not be limited to the following:
 - 1. Asbestos fiber leakage to interior building areas.
 - 2. Contractor disregards the authority of the Owner's Representative.
 - 3. Contractor disregards laws or regulations of any public body having jurisdiction.
 - 4. Contractor's work presents a risk to the building or building occupants.
- C. The absence of a stop work order by the Owner or the Owner's Representative shall not in any way be construed as an approval or acceptance of the Contractor's work.

1.08 RELATED SECTIONS

- A. Carefully examine the Contract Documents for requirements that affect the work of this section.
- B. Other work that directly relates to the work of this section, includes, but is not necessarily limited to, the following:

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1. Section 013300 Submittal Procedures
2. Section 024119 Selective Demolition
3. Section 028433 Removal and Disposal of Polychlorinated Biphenyls
4. Section 085113 Aluminum Windows

1.09 DEFINITIONS

- A. All terms not defined herein shall have the meaning given in the applicable publications and regulations.
- B. Abatement: Procedures to control the release of asbestos fibers from ACM; includes removal, encapsulation, and enclosure of ACM.
- C. ACM: Asbestos-containing material.
- D. Adequately Wet: Sufficiently mixed or penetrated with liquid to prevent the release of particulate. If visible emissions are observed coming from the ACM, then that material has not been adequately wetted.
- E. Air Monitoring: The process of measuring the fiber content of a known volume of air collected over a specified period of time. The NIOSH 7400 Method, Issue 2 is used to determine the fiber levels in air.
- F. Air Intake: Any opening through which air is admitted to an air-handling system in a building.
- G. Amended Water: Water to which a surfactant has been added.
- H. Asbestos: Includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated or altered.
- I. Asbestos-containing material (ACM): Any material containing one percent or more asbestos of any type or mixture.
- J. Authorized Visitors: Any visitor authorized by the Owner or any representative of a regulatory agency or other agency having jurisdiction over the project.
- K. Clean Room: An uncontaminated room that is a part of the worker decontamination unit and in which worker's street clothes and protective equipment can be stored.
- L. Competent Person: In addition to the definition in 29 CFR 1926.32(f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f); in addition, for Class I and II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor.
- M. Decontamination Area/Unit: An enclosed area adjacent to and connected to the regulated area and consisting of an equipment room, shower room, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.
- N. Employee Exposure: The exposure to airborne asbestos that would occur if the employee were not wearing respiratory protection equipment.

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- O. HEPA Filter: High-Efficiency Particulate Air (HEPA). An air filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles sized 0.3 micrometer in diameter.
- P. HEPA Vacuum: Vacuum equipment with HEPA filter system for filtering the exhaust air from the unit.
- Q. Negative Initial Exposure Assessment: A demonstration by the employer that complies with the criteria in 29 CFR 1926.1101 (f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PEL's.
- R. Owner: Peabody Public Schools
- S. Owner's Representative: The Owner's Project Manager, Architect, Engineer, or Industrial Hygiene Consultant.
- T. Regulated Area: An established area where airborne concentration of asbestos fibers exceeds or can reasonably be expected to exceed the permissible exposure limit.
- U. Removal: All herein-specified procedures necessary to remove asbestos-containing materials from the designated areas and to dispose of these materials at an acceptable site.
- V. Waste Generator: Any owner or operator whose act or process produces asbestos-containing waste material.
- W. Waste Shipment Record: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposal of asbestos-containing waste material.
- X. Work Area: The area or location where asbestos abatement or asbestos-associated work is being performed.

1.10 CODES, REGULATIONS, AND STANDARDS

A. General Applicability

- 1. All work under this contract shall be done in strict accordance with applicable Federal, State, and local regulations, standards and codes governing asbestos abatement, and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.
- 2. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirement(s) shall be utilized.
- 3. Copies of all standards, regulations, codes and other applicable documents, including this specification shall be available at the worksite.

- B. Contractor Responsibility. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and local regulations related to all aspects of the abatement project. The Contractor is responsible for providing and maintaining training, accreditation, medical exams, medical records, and personal protective equipment as required by applicable Federal, State and local regulations. The Contractor shall hold the Owner and Owner's Representatives harmless for any failure to comply with any applicable work, packaging, transporting, disposal, safety, health, or environmental requirement on the part of the Contractor, Contractor's employees, or subcontractors of the Contractor.

C. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in text by basic designation only. The publications listed below are not intended to be all inclusive of each regulation prevailing over the work.

1. Environmental Protection Agency (EPA):
Title 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP)
Title 40 CFR Part 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, And Use Prohibitions
Title 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA)
2. Occupational Safety and Health Administration (OSHA):
Asbestos Construction Standard 29 CFR Part 1926.1101
Asbestos General Industry Standard 29 CFR 1910.1001
Respiratory Protection, 29 CFR 1910.134
Construction Industry Standards, 29 CFR 1926
3. U.S. Department of Transportation:
49 CFR 171 and 172
4. National Institute for Occupational Safety and Health (NIOSH):
"Respiratory Protection A Guide for the Employee."
5. American National Standards Institute (ANSI):
Z86.1-1973 - Commodity Specification for Air
Z88.2-1980 - Respiratory Protective Equipment
6. Massachusetts Department of Labor Standards:
The Removal, Containment or Encapsulation of Asbestos (453 CMR 6.00), including all clarifications, policy statements, etc.
7. Massachusetts Department of Environmental Protection:
310 CMR 7.00, 7.09, 7.15 and all related amendments and policy statements.

1.11 NOTIFICATIONS AND PERMITS

A. Obtain all necessary permits and provide notices as required to the following agencies:

1. Commonwealth of Massachusetts
(10 working days prior to start)
Asbestos Program
PO Box 120087
Boston, Massachusetts 02112-0087
2. City of Peabody Health and Fire Departments.

B. The Contractor shall be responsible for payment of all required fees, which shall be included in the Contractor's bid price, and to obtain all necessary permits prior to the start of work. Verification of notification and permits shall be submitted to the Owner.

1.12 SITE SECURITY

A. Regulated area access is to be restricted to authorized trained/accredited and protected personnel. The Contractor's Competent Person shall control site security during abatement operations in order to isolate work in progress and protect adjacent personnel.

1.13 EMERGENCY PRECAUTIONS

A. A site specific Emergency Action Plan shall be submitted by the Contractor prior to the pre-construction meeting and shall be approved by the Owner. The Plan shall meet the requirements of 29 CFR 1926.35.

1.14 RESPIRATORY SYSTEMS

- A. The Contractor shall develop and implement a Respiratory Protection Program (RPP) that complies with the January 8, 1998 OSHA requirements, 29 CFR 1926.1101 and 29 CFR 1910.132 and 134. All respirators used must be NIOSH approved for asbestos abatement activities.
- B. Minimum respiratory protection shall conform to current OSHA and Massachusetts DLS regulations including 29 CFR 1926.1101 and 453 CMR 6.00.

1.15 WORKER PROTECTION

- A. Prior to beginning any abatement activity, all personnel shall be trained in accordance with OSHA 29 CFR 1926.1101 (k)(9). Training must include, at a minimum, the elements listed at 29 CFR 1926.1101 (k)(9)(viii). Training shall have been conducted by an EPA approved trainer meeting the requirements of EPA 40 CFR 763 Appendix C (AHERA MAP). Initial training certificates and current refresher and accreditation proof must be submitted for each person working at the site.
- B. Medical examinations meeting the requirements of 29 CFR 1926.1101 (m) shall be provided for all personnel working in the regulated area, regardless of exposure levels. The physician's written opinion as required by 29 CFR 1926.1101 (m)(4) shall be provided for each person.
- C. Provide boots, booties, hard hats, goggles, clothing, respirators and any other personal protective equipment as determined by conducting the hazard assessment required by OSHA at 29 CFR 1910.132 (d). The Competent Person shall ensure the integrity of personal protective equipment worn for the duration of the project.
- D. The Competent Person shall ensure that each time workers enter the regulated area, they observe and follow all required procedures and wear appropriate personal protective equipment.
- E. The Competent Person shall meet all requirements of 29 CFR 1926.1101 (o) and assure that all requirements for regulated areas at 29 CFR 1926.1101 (e) are met. All personnel in the regulated area shall not be allowed to eat, drink, smoke, chew tobacco or gum, apply cosmetics, or in any way interfere with the fit of their respirator.
- F. Provide Fall Protection Training and OSHA required body safety equipment for all work performed at a height of 6-feet above a lower level.

1.16 DECONTAMINATION FACILITIES

- A. For each abatement area, provide decontamination facilities located in an area agreed upon with the Owner's Representative.
- B. The decontamination facility shall consist of three rooms separated by air locks as follows: Clean Room followed by Shower Room followed by an Equipment Room leading to the Work Area.
- C. An Airlock consists of a curtained doorway constructed by placing three overlapping sheets of plastic over a framed doorway, securing each along the top of the doorway. The first and third sheet shall be secured on one side of the doorway and the middle sheet shall be secured on the other side of the doorway.

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- D. Clean Room. The Clean Room shall be of sufficient size for workers to dress into street clothing following showering and exiting the Work Area. Provide lockers or appropriate storage containers for employee use in the Clean Room. Provide a supply of uncontaminated disposable protective clothing and equipment to change into prior to entering into the contaminated area.
- E. Shower Room. Shower facilities shall be provided which comply with 29 CFR 1910.141(d)(3). The shower facilities shall be adequate to allow decontamination and thorough washing of all the workers and visitors within a ten minute period. The hot and cold shower water shall be functional at all times while workers are within the work area enclosure. Shower water shall be collected and filtered with a 5.0 micron filter prior to disposal. Dispose of filter as asbestos waste.
- F. Equipment Room. The Equipment Room shall be supplied with impermeable labeled bags and containers for the containment and disposal of contaminated equipment. In this room workers and visitors dispose of their disposable protective clothing except the respirator as they prepare to enter the Shower Room.
- G. Provide heating and ventilation in entire decontamination facility so that airflow will be from the outside towards the workspace. Where heat is required, a fire protection plan must be submitted to the Fire Department for approval, and is subject to review of the Owner's Representative.
- H. For window removal work, provide a minimum of an equipment room or area at each regulated work area for the decontamination of workers and equipment contaminated with asbestos. The equipment room or area shall be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment. Employees shall enter and exit the regulated area through the equipment room or area.

1.17 CONTAINMENT BARRIERS

- A. Physical barriers shall be employed to restrict access to the regulated work area.
- B. Critical barriers shall be placed over all openings to the regulated area. Seal off perimeter of work area to completely isolate abatement areas and to contain all airborne contamination created by abatement work. Provide warning signs at each visual and physical barrier per OSHA and MA DLS requirements.
- C. Isolate the work area from adjacent building areas and the exterior by installation of two layers of fire-rated polyethylene sheeting barriers at least 6-mil in thickness. Enclose work areas with two layers of fire-rated polyethylene sheeting 6-mil thickness on floors and walls.
- D. Individually seal all heating and ventilation openings by installation of fire-rated polyethylene sheeting 6-mil thickness.
- E. For removal of windows, seal inside of window openings with two layers of 6-mil polyethylene sheeting and individually seal all heating and ventilation openings on the exterior of the building within twenty feet of the regulated work area by installing of polyethylene sheeting barriers.

1.18 AIR FILTRATION SYSTEM

- A. The Contractor shall provide local exhaust ventilation in the work area to the outside and maintain a negative pressure in the work area relative to the adjacent non-work areas. The exhaust units must be equipped with a High Efficiency Particulate Air (HEPA) filter capable of

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retaining 99.97% of the asbestos fibers. This filter must comply with ANSI Z9.2 standards. The fan for each unit should be sized to draw a desired airflow through the filters in the unit at a specified pressure drop. The unit should have an air-handling capacity of 1,000 to 2,000 ft./min. (under "Clean" filter conditions).

- B. The system should be capable of delivering a minimum of one air change every 15 minutes. Fifteen-minute air changes are mandatory for removal. All exhaust units shall be vented outside the building. The Contractor shall have a minimum of two (2) additional air filtration devices on site as back-up units.
- C. All air filtration units utilized on the project shall be delivered to the site in good condition with no visible debris. HEPA filters shall contain no dents, cuts, tears, and be free from dust or debris build-up. The Contractor shall deliver new secondary and pre-filters to the site for each unit and install the new filters on site. Warning lights and audible alarms are required to indicate normal operation, too high a pressure drop across the filters (i.e., filter overloading) and too low of a pressure drop (i.e., major rupture of HEPA filter or obstructed discharge).
- D. Notify the Owner's Representative in advance when filter installation is planned to allow observation of the installation.
- E. Pressure differential across the filters shall be less than 0.2" inches of water.
- F. The air filtration system shall be operated on a continuous 24-hour basis throughout the abatement process through final air clearance and containment dismantling. The ventilation system shall be in accordance with EPA recommendations included in the "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings".
- G. Provide one automatic recording air pressure manometer for each work area enclosure in locations acceptable to the Asbestos Consultant. The manometer shall continuously generate a permanent record, which shall be submitted to the Owner's Representative prior to final acceptance.
- H. No work will be allowed when the pressure differential is less than 0.02" relative to adjacent building areas.
- I. Prior to the start of work, the Contractor shall submit to the Owner's Representative for approval, a design of the negative pressure filtration system to be used. Submittal shall include a drawing indicating number, location, and size of air filtration units, points of exhaust, projected airflow within work area and supporting calculations for sizing.

1.19 DISPOSAL ACTIVITIES

- A. The Contractor shall comply with current DOT, EPA, OSHA and MA DEP waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill.
- B. Disposal of ACM shall be in a landfill permitted to accept ACM and PCBs, operated in accordance with regulatory requirements of 40 CFR 61 (NESHAP) and applicable state and local regulations.
- C. Refer to Section 028433 Removal and Disposal of Polychlorinated Biphenyls for PCB-containing waste disposal requirements.

1.20 SUBMITTALS

- A. Submittals shall be in accordance with Specification Section 013300 Submittal Procedures.

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B. The following submittals shall be submitted to the Owner's Representative at the Pre-construction meeting. Submittals shall be submitted to and approved in writing by the Owner's Representative prior to the Contractor receiving approval to begin work.

1. Copies of Regulatory Agency notifications.
2. Certificates of Insurance.
3. A site-specific asbestos abatement plan. The abatement plan shall include, but not be limited to the following: abatement methods and procedures; details of work area containment; decontamination facilities; air filtration; and procedures for handling and disposing of waste.
4. A written project schedule. The schedule shall be date specific and include all phases of the project.
5. A list of all employees to be used on this project. Include certificates of training, documentation of medical examination including a physician's determination that the employee is able to wear a respirator and documentation of current successful respirator fit test (29 CFR 1926.1101 Appendix C).
6. Emergency Action Plan.
7. Proposed waste disposal site, waste transporter and a waste disposal plan. Include name, address, telephone number and operating permits, etc.
8. A list of equipment to be used on the project.
9. Material safety data sheets (MSDS) for all materials and products to be used by the Contractor on this project.

B. During Construction

1. Personal air sampling results.

C. Post Construction Submittals

1. Original copy of waste shipment records signed by the waste generator, transporter and landfill operator demonstrating that the ACM removed from the project has been packaged, removed and disposed of properly.
2. Provide the owner with copies of on-site job logs, notifications, permits, accident reports, personal air monitoring results and waivers of lien, if applicable.

PART 2 - MATERIALS AND EQUIPMENT

2.01 MATERIALS

- A. Deliver all materials in original packages, containers or bundles bearing the name of the manufacturer.
- B. Damaged, deteriorating, contaminated or previously used products or equipment shall not be used on this project, and shall be removed from the worksite and disposed of properly.
- C. Polyethylene sheeting shall be at least 6-mil thickness, shall be fire retardant and shall meet all applicable standards for temporary construction barriers.
- D. All lumber shall be fire rated.
- E. Duct tape or other waterproof tape, furring strips, spray glue, staples, nails, screws, or other materials shall be available to secure polyethylene sheeting.

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- F. Disposable bags shall be of 6-mil polyethylene, on which labels are directly printed, as required by EPA and DOT regulations.
- G. Asbestos warning signs that are posted at all approaches and/or entrances to work areas shall conform to OSHA 29 CFR 1926.1101.
- H. All fire extinguishers required for the project shall be ABC class type, properly pressurized and in good working condition.
- I. Adequately stocked first aid kits shall be on-site.
- J. Surfactant (wetting agent) shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5 gallons of water or as specified by manufacturer. An "equivalent surfactant" shall be understood to mean a material with a surface tension of 29 dynes/cm as tested in its properly mixed concentration, using ASTM method D1331-56- ("Surface and Interfacial Tension of Solutions of Surface Active Agents").

2.02 TOOLS AND EQUIPMENT

- A. Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without exposure to persons or property. The equipment shall be secured at all times and access restricted to unauthorized personnel.
- B. Vacuum Equipment: All vacuum equipment utilized in the work area shall utilize HEPA filtration systems, 99.97% efficient to 0.3 microns particulate size. Deliver all vacuums to the site with clean waste containers and new HEPA filters installed. Vacuum wands, brushes, hoses, and other accessories shall be delivered to the site new or if previously used shall be delivered to the site in airtight disposal bags.
- C. The Contractor shall provide approved respirators and protective clothing to all Contractor personnel, to representatives of the Owner, and to representatives of the State or other governmental entity who may inspect the jobsite.
- D. Protective clothing requirements include:
 - 1. One-time use, disposable, full-body coveralls made of Tyvek fabric or approved equal.
 - 2. Hard Hats
 - 3. Eye protection
 - 4. Gloves
 - 5. Respiratory protective equipment in accordance with OSHA 29 CFR 1926.1101 and 29 CFR 1910.134. Respirators shall be NIOSH/MSHA approved for protection against asbestos exposure.
- E. The Contractor shall have sufficient equipment to mix and spray wetting agent and encapsulants.
- F. The Contractor shall have a sufficient quantity of scaffolding, ladders, platforms, hand tools, and materials to conduct the abatement project in an efficient and workmanlike manner. All equipment shall be used according to OSHA Safety and Health Standards for the Construction Industry (29 CFR Part 1926).
- G. All electrical cord and connections within all work areas shall be protected with ground-fault circuit interrupters (GFCI).

PART 3 - EXECUTION

3.01 COORDINATION AND SCHEDULING

- A. The Contractor shall coordinate all work with the Owner and the General Contractor.
- B. The Contractor shall submit to the Owner, prior to contract performance, a schedule of work.

3.02 WORK AREA PREPARATION

- A. The Contractor shall establish a regulated asbestos removal work area where ACM will be removed. Asbestos danger tape and warning signs shall be posted along the perimeter of the regulated area. Security procedures shall be used to ensure that only authorized persons are allowed in the regulated areas. Maintain a log of all people entering and exiting the workplace.
- B. Construct solid temporary barriers as necessary to isolate the work area from occupied building areas. Ensure that temporary barriers do not block egress to corridors, stairwells, etc.
- C. Decontaminate and remove all moveable items from regulated area.
- D. Cover all non-moveable or fixed objects remaining in the work area with 6-mil fire-rated polyethylene sheeting. Protect mechanical equipment from contamination and damage.
- E. Seal critical barriers to the work area(s) using two layers of polyethylene sheeting.
- F. Coordinate shut down and lock out of HVAC equipment in the regulated area with the Owner. Preclean all HVAC system components and completely seal with 2 layers of 6-mil fire-rated polyethylene sheeting.
- G. Install 2 layers of 6-mil fire-rated polyethylene sheeting on all floors and secure with duct tape. Extend floor sheeting 12 inches up walls.
- H. Install 2 layers of 6-mil fire-rated polyethylene sheeting on all wall surfaces and secure all seams with duct tape. Wall sheeting shall overlap the upturned floor sheeting.
- I. Install decontamination facility for workers and equipment.
- J. Shut down and disconnect all electrical power in accordance with OSHA 29 CFR 1926.417 (Lockout and Tagging of Circuits) to the work area so that there is no possibility of reactivation and electrical shock during the entire abatement process. The Contractor shall utilize tagging, color coding, and other means as necessary to prevent worker injury from energized components.
- K. Install temporary power panels and lighting with GFCI protection. Provide temporary power as required by the Asbestos Consultant for all air monitoring stations. Protect all power cables, panels, transformers, lighting, etc. from moisture, contamination, and fire and electrical hazards.
- L. Install negative pressure manometers with hard copy data output in one location per work area.

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For Window Removal Work:

- M. Isolate all heating and ventilation air intake sources within twenty feet of window removal activity by sealing all openings with polyethylene sheeting.
- N. Cover the ground beneath all work activity with an impermeable drop cloth.
- O. For removal of ACM caulk, the Contractor shall provide at a minimum, an equipment room or area adjacent to the regulated area and a remote three stage decontamination unit on site. The equipment room or area shall be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment. Employees shall enter and exit the regulated area through the equipment room or area.

3.03 INSPECTION OF NEGATIVE PRESSURE ENCLOSURES

- A. Contractor shall notify Owner's Representative (provide 48-hours advance notice) when the work area preparations are completed. Owner's Representative will perform a pre-inspection check of the preparations prior to the start of abatement work.

3.04 ASBESTOS REMOVAL - Ceiling Tile

- A. Spray with amended water all materials to be removed. All materials to be removed shall be wetted prior to removal. Apply a low-pressure fine spray of the amended water to minimize fiber release. Saturate sufficiently the material throughout the removal process so that there will be at no time visible emissions from dry asbestos.
- B. Remove ACM ceiling tiles as intact sections or components whenever possible, minimizing disturbance of the material to the greatest degree possible. Materials that are more than 15 feet above the ground must be containerized at the removal height. Workers shall not drop the containers, but must carefully lower them to floor level to ensure that their integrity is not compromised.
- C. Workers shall containerize removed material into properly labeled six mil polyethylene bags or poly lined drums as soon as possible after removal. Do not allow the removed material to accumulate prior to being containerized. Workers shall periodically spray surrounding areas with amended water and maintain them in a wet condition until all visible material is cleaned.
- D. In no instances shall the Contractor fail to containerize all materials including debris prior to the shift breaking for lunch, or at the end or change of a shift. Prior to beginning removal in a new area, all previously removed materials shall be containerized.
- E. Containers (6-mil polyethylene bags, or metal drums) shall be sealed when full. Bags shall be deflated while within the work area and sealed airtight. Containers shall be labeled according to EPA regulations (40 CFR 61.150) and DOT regulations (49 CFR Part 171-180). If bags are used, double bagging is required. The first bag shall be wet cleaned after sealing and then placed into a clean second bag in the decontamination facility (or waste removal unit) before removing it from the work area. Bags shall not be overfilled. Bags shall be sealed leak-tight.
- F. Asbestos-containing waste with sharp-edged components that may tear polyethylene bags shall first be placed into reinforced bags or into labeled leak-tight drums for disposal.
- G. Disposal shall be in a landfill meeting EPA and any other federal, state, and local requirements and shall be subject to the approval of the Owner.

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- H. All used polyethylene, tapes, cleaning material and clothing shall be treated as asbestos waste material.
- I. After all ACM have been removed and all containerized waste shall be removed from the work area, workers shall clean the entire area using HEPA-vacuum and wet wiping techniques, starting from the uppermost area(s) and working down to ground level. All items in the work area are to be thoroughly cleaned and decontaminated, until no visible debris remains.

3.05 ASBESTOS REMOVAL - Caulk, Glazing Compound, Doors and Window Frames

- A. Removal of door and window frames and associated ACM shall be performed from the exterior of the building.
- B. Perform work area preparations in accordance with Section 3.02.
- C. Personal protective equipment, including, but not limited to, appropriate respiratory protection, 2 layers of disposable protective clothing, eye protection, etc., shall be used at all times by workers performing ACM caulk and window frame removal.
- D. Spray all materials to be removed with water containing a wetting agent.
- E. Remove loose caulk and glazing compound from window frames using manual removal methods. Use of sanders, grinders, saws, or other mechanical equipment is prohibited. Place directly into 6-mil thickness asbestos disposal bags. All waste shall be double bagged.
- F. Remove frames from openings. Apply amended water or penetrating encapsulant and immediately wrap each frame unit in two (2) independent layers of polyethylene sheeting and seal. Reinforced disposal bags or fiber drums shall be used for disposal of sharp objects that may tear polyethylene disposal bags. Transfer containerized waste to the waste container.
- G. Remove all remaining caulk from masonry openings using wet methods and hand tools.
- H. Clean masonry openings by HEPA vacuuming and wet wiping to remove all visible dust and debris.
- I. Clean regulated area by HEPA vacuuming and wet wiping to remove all visible dust and debris.
- J. Dry Sweeping is prohibited. The Contractor shall ensure that no visible dust emissions are generated by the work.

3.06 ALTERNATIVE PROCEDURES

- A. The Contractor shall at all times use the procedures described in this specification.
- B. If the specified procedures cannot be utilized, the Contractor shall notify the Owner's Representative in writing providing details of the problem encountered, and recommending alternative procedures, and requesting permission to follow the alternative procedures.
- C. Alternative procedures shall provide to all personnel, the Owner's property and to the environment, protection equivalent or greater than that provided by procedures that they replace.
- D. Alternative procedures must be approved in writing by the Owner's Representative prior to implementation.

3.07 MONITORING, TESTING AND INSPECTION

- A. The Contractor is responsible for personnel monitoring for airborne asbestos fibers in compliance with OSHA regulations. The Owner's Representative may, at his or her discretion, also conduct personnel monitoring on Contractor personnel and area air monitoring at locations inside and outside of the work area.
- B. The Contractor shall provide support to the Owner's Representative throughout the abatement process including, but not limited to, lighting and temporary electrical power.
- C. Contractor is responsible for meeting OSHA requirements for his personnel, including but not limited to, monitoring requirements, safety compliance training and record keeping. Personal monitoring results from the previous day shall be posted at the job site, and copies of the results forwarded to the Owner's Representative.

3.08 CLEANING AND FINAL DECONTAMINATION

- A. After the removal of the asbestos has been completed and before removal of barriers, the entire area shall be thoroughly wet cleaned and vacuumed with HEPA filtered vacuum. All polyethylene sheeting, tapes and disposable contaminated equipment shall also be disposed of as asbestos waste. All reusable contaminated equipment such as respirators, hard hats, etc., shall be thoroughly decontaminated through wet cleaning.

3.09 FINAL INSPECTION AND TESTING

- A. Notify Owner's Representative in writing a minimum of 24 hours in advance of the completion of all final cleaning activities and removal of all waste from the work area.
- B. The Owner's Representative will visually inspect the workspace for the detection of any visible dust, debris or contamination. The Contractor shall perform additional removal of ACM and ACM contaminated materials and shall repeat final cleaning of the work area until the level of cleanliness has been approved by the Owner's Representative. All additional removal and cleaning shall be at the Contractor's sole expense.
- C. Provide all necessary support for final visual inspection of the work area. Support shall include providing all necessary temporary lighting, scaffolding, ladders, electrical power, and decontamination facilities.
- D. Contractor shall allow 24-hours in the project schedule for each work area for final air clearance testing by the Owner's Representative after successful completion of the Owner's Representative's visual inspection and lockdown of the work area.
- E. Final air clearance sampling in ceiling tile removal work areas will be performed as follows:
 - 1. For removal of 160 square feet or less or 260 linear feet or less of ACM, a minimum of five (5) air samples will be collected inside the work area using aggressive sampling methods with analysis by phase contrast microscopy. Final air clearance limit is no inside work area sample greater than 0.010 f/cc.
 - 2. For removal of greater than 160 square feet or 260 linear feet of ACM, a minimum of five (5) air samples will be collected inside the work area using aggressive sampling methods with analysis by transmission electron microscopy (TEM). Final air clearance limits shall be an average of 70 structures per millimeter square or less.

3.10 RESTORATION AND REPAIRS

- A. Repair and restore space in accordance with the final inspection punchlist performed by the Owner's Representative.

3.11 RESPONSIBILITY FOR DAMAGES

- A. Any damages to the building, including but not limited to, interior finishes from installation of barriers and grounds that has been the result of actions by the Contractor personnel shall be repaired to their original condition without any additional cost to the Owner.

END OF SECTION

SECTION 024119

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Types of Selective Demolition Work: Demolition requires selective removal and subsequent off-site disposal of following:
 - a. Selective demolition as indicated on Drawings and as required to accommodate new construction.
 - 2. Removal Work Specified Elsewhere:
 - a. 020800, Asbestos Abatement.
 - b. 028433, Removal and disposal of PCBs.
 - c. 085113, Aluminum Windows; for removal of existing windows and related window installation materials and subsequent installation of new windows and installation materials.

1.02 SUBMITTALS

- A. Schedule:
 - 1. Submit Schedule indicating proposed methods and sequence of operations for selective demolition work to Owner's Representative for review before beginning work.
 - 2. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

1.03 JOB CONDITIONS

- A. Occupancy:
 - 1. Owner reserves the right to continuously occupying building areas immediately adjacent to selective demolition areas.
 - 2. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations.
 - 3. Provide Owner min. 72 hours advance notice of demolition activities that will severely affect Owner's normal operations.
- B. Condition of Structures:
 - 1. Owner assumes no responsibility for actual condition of items or structures to be demolished.
 - 2. Conditions existing at commencement of Contract will be maintained by Owner insofar as practicable.
 - 3. Variations within structure may occur by Owner's removal and salvage operations before start of selective demolition work.
- C. Partial Demolition and Removal:
 - 1. Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses.
 - 2. Where items are to be removed and salvaged for reuse, coordinate removal of all items that do not have PCB or Asbestos before beginning PCB or Asbestos work.
 - 3. Transport salvaged items from site as they are removed.
 - 4. Do not store or sell removed items on site.
- D. Damage: Promptly repair damage caused to adjacent facilities by demolition work at no

cost to Owner.

- E. Traffic:
 - 1. Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
 - 2. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction.
 - 3. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Explosives: Do not use explosives.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Structure Safety:
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structures to be demolished and adjacent facilities to remain.
 - 2. Stop operations and immediately notify Owner's Representative if safety of structure appears to be endangered.
 - 3. Take precautions to support structure until determination is made for continuing operations.

3.02 DEMOLITION

- A. General:
 - 1. Perform selective demolition work in systematic manner.
 - 2. Use such methods as required to complete work indicated on Drawings in accordance with Demolition Schedule and governing regulations.
- B. Disposal of Demolished Materials: Comply with requirements of 310 CMR 19.017 and any requirements related to hazardous materials.
 - 1. Remove debris, rubbish, and other materials resulting from demolition operations from building site.
 - 2. Transport and legally dispose of materials off site.
 - 3. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
 - 4. Do not burn removed materials on Project site.

END OF SECTION

SECTION 079200

JOINT SEALANTS

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 SUMMARY

- A. Section Includes: Work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.
 - 1. One-part, medium-modulus elastomeric building silicone sealant for exterior above-grade joints in vertical and overhead horizontal surfaces, complete with polyethylene backer rod.
 - 2. Paintable acrylic emulsion joint sealers for interior joints in vertical surfaces and horizontal nontraffic surfaces, except as otherwise noted.
- B. Related Sections:
 - 1. 085113, Aluminum windows; for coordinating installation of joint sealants after completion of window installation.
 - 2. 099100, Painting; for interior touch up of existing finish coatings where disturbed or damaged due to window installation and subsequent interior sealant installation.
 - 3. 028433, surface preparation at remediated surfaces.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each joint sealer product required, including instruction for joint preparation and joint sealer application.
- B. Certificates: Submit certificates from manufacturers of joint sealers attesting that products comply with Specification requirements and are suitable for use indicated.

1.03 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer:
 - a. Firm who has successfully completed within last 3 years min. 3 joint sealer applications similar in type and size to that of this Project.
 - b. Firm who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.
- B. Design Criteria:
 - 1. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from single manufacturer for each different product required.
 - 2. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for

use, pot life, curing time, and mixing instructions for multicomponent materials.

- B. Store and handle materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.05 PROJECT/SITE CONDITIONS

A. Environmental Conditions:

- 1. Do not proceed with installation of joint sealers under following conditions:
 - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealer manufacturer or below 40 deg. F (4.4 deg.C).
 - b. When joint substrates are wet due to rain, frost, condensation, or other causes.

- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

- C. Sequence installation of joint sealers to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:

- 1. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- 2. Sealant Color:
 - a. Concealed Joints: Use sealant with manufacturer's standard color having best overall performance qualities for indicated application.
 - b. Exposed Joints: Use sealant as selected from manufacturer's standard or special colors, as selected by Architect.

B. Exterior Elastomeric Joint Sealants:

- 1. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C920 requirements, including those referenced for Type, Grade, Class, and Uses.
- 2. Single-Component Silicone Sealant:
 - a. Type and Grade: S (single-component) and NS (nonsag).
 - b. Class: 100/50.
 - c. Use Related to Exposure: NT (nontraffic).
 - d. Product: Dow Corning Corp. Model 790, GE Silicones Model SilPruf LM SCS2700, Tremco Model Spectrem 1 (Basic).

C. Exterior Joint Sealant Backing:

- 1. General: Provide sealant backings of material and type which are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- 2. Plastic Foam Joint Fillers:
 - a. Preformed, compressible, resilient, nonwaxing nonextruding strips of plastic foam of material indicated and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - b. Nongassing closed-cell polyethylene foam, subject to approval of sealant manufacturer.

3. Bond-Breaker Tape:
 - a. Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back, third surface, of joint.
 - b. Provide self-adhesive tape where applicable.
- D. Interior Latex Joint Sealant:
 1. Comply with ASTM C834, Type P, Grade NF.
 2. Product: Bostik Findley Model Chem-Calk 600, Pecora Corp. Model AC-20+, Sonneborn Div. (Degussa) Model Sonolac, Tremco Model Tremflex 834.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealer performance.
- B. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Surface Cleaning of Joints:
 1. Clean out joints immediately before installing joint sealers to comply with recommendations of sealant manufacturers and following requirements.
 2. Remove all foreign materials from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water-repellent; water; surface dirt; and frost.
 3. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
- B. Joint Priming:
 1. Prime joint substrates where indicated or where recommended by sealant manufacturer based on preconstruction joint sealer-substrate tests or prior experience.
 2. Apply primer to comply with sealant manufacturer's recommendations.
 3. Confine primers to area of joint sealer bond.
 4. Do not allow spillage or migration to adjoining surfaces.
- C. Masking Tape:
 1. Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.
 2. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION

- A. General:
 1. Comply with sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

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2. Elastomeric Sealant Installation Standard:
 - a. Comply with recommendations of ASTM C962 for use of joint sealants as applicable to materials, applications, and conditions indicated.
 - b. Ensure building joint width at time of installation is 4 times expected joint movement.
 3. Latex Sealant Installation Standard: Comply with requirements of ASTM C790 for use of latex sealants.
- B. Sealant Backings:
1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 2. Do not leave gaps between ends of joint fillers.
 3. Do not stretch, twist, puncture, or tear joint fillers.
 4. Remove absorbent joint fillers which have become wet before sealant application and replace with dry materials.
 5. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where required to prevent third side adhesion of sealant to back of joint.
 6. Install compressible seals serving as sealant backings to comply with requirements indicated for joint fillers.
- C. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- D. Tooling of Nonsag Sealants:
1. Immediately after sealant application and before time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint.
 2. Remove excess sealants from surfaces adjacent to joint.
 3. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 4. Provide concave joint configuration per Figure 6A in ASTM C962, unless otherwise indicated.

3.04 PROTECTION AND CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.
- B. Protection:
1. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at Substantial Completion.
 2. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

SECTION 084500

TRANSLUCENT ASSEMBLIES

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 SUMMARY

- A. Section Includes: Work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.
 - 1. Site-assembled translucent system consisting of extruded polycarbonate glazing panels incorporated into complete aluminum framed system tested and warranted by manufacturer as single source system.
 - 2. System complete with all anchors, brackets, and hardware attachments necessary to complete specified assembly, weatherability, and water-tightness performance requirements.
 - 3. System complete with all flashing up to but not penetrating adjoining work are also required as part of system.
- B. Related Sections:
 - 1. 079200, Joint Sealants; for sealants installed at translucent assembly perimeter.

1.02 SYSTEM PERFORMANCE REQUIREMENTS

- A. Performance: Provide translucent assembly, including anchorage, capable of withstanding, without failure, effects of following:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Movements of supporting structure.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
- B. Failures Includes Following:
 - 1. Deflection exceeding specified limits.
 - 2. Water leakage.
 - 3. Thermal stresses transferred to building structure.
 - 4. Noise or vibration created by wind and thermal and structural movements.
 - 5. Transfer of stresses to glazing, including those caused by thermal and structural movements.
 - 6. Loosening or weakening of fasteners, attachments, and other components.
 - 7. Sealant failure.
- C. Structural Loads:
 - 1. Concentrated Live Loads: Min. 250 lbf applied to framing members at locations that will produce greatest stress or deflection.
 - 2. Load Combinations: Calculate according to Code requirements and min. 40 lb. snow load and min. 100 mph wind loads; whichever is greater.
- D. Lateral Bracing of Framing Members:
 - 1. Compression flanges of flexural members are laterally braced by cross-members with minimum depth equal to 50 percent of flexural member that is braced.

2. Glazing does not provide lateral support.

E. Thermal Movements:

1. Allow for thermal movements from ambient and surface temperature changes.
2. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
3. Temperature Change (Range): 120 deg. F (67 deg.C), ambient; 180 deg. F (100 deg.C), material surfaces.

1.03 SUBMITTALS

A. Product Data:

1. Including manufacturer's, brochures and data for materials and fabrication of translucent assembly, and recommendations for installation and maintenance.
2. Submit from manufacturer written guarantee accompanied by substantiating data, stating that the products to be furnished are in accordance with or exceed this Section.

B. Shop Drawings:

1. Submit shop drawings showing adaptation of manufacturer's standard system to Project; include typical unit elevations at 1/2 in. scale and details at 3 in. scale, to show dimensioning, member profiles, anchorage system, interface with building construction, and glazing.
2. Show clearly where and how manufacturer's system deviates from Drawings and Specifications.
3. Include structural computations, material properties, and other information needed for structural analysis that has been prepared by, or under supervision of, qualified professional engineer.

C. Structural Calculations:

1. Provide for information only, prepared in accordance with Aluminum Association's Specifications for Aluminum Structural (ASS30) and bearing seal of structural engineer qualified in design of translucent assembly and licensed in State of Massachusetts.
2. Indicate section moduli of wind-load-bearing members, and calculations of stresses and deflections for performance under design loading.

D. Certified Test Reports:

1. Submit from manufacturer certified test reports made by independent organization for each type and class of panel system, with reports verifying that material will meet all performance requirements of this Section; previously completed test reports will be acceptable if they are current and indicative of products used on this Project.
2. Test reports required are:
 - a. Self Ignition Temperature (ASTM F1929)
 - b. Smoke Density (ASTM D2843)
 - c. Burning Extent (ASTM D635)
 - d. Interior Flame Spread (ASTM E84)
 - e. Color Difference (ASTM D2244)
 - f. Weathering (ASTM D4364)
 - g. Yellowing Index (ASTM D1925)
 - h. Weathering Evaluation before and after exposure to 300 deg.F, 25 minutes include Light Transmission, Color Change, and Yellowing Index, per ASTM E1175, ASTM D2244, and ASTM D1925 respectively.
 - i. Shatter Resistance (ASTM D3841/SPI Method B)
 - j. Large Missile Test - Impact Resistance per SFBC PA 201-94
 - k. Insulation ΔU Factor per NFRC100 test methods & procedures

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- l. Water Penetration (ASTM E331)
 - m. Load Bearing Capability (ASTM E330)
 - n. OSHA Life Safety Fall and Walk Through Protection for 300 lb. point load per STD 29 CFR 1910.23 (e)(8)
 - o. OSHA Life Safety STD 29 CFR - Impact loading by blunt object of 500 ft. lbs. per ASTM E695
 - p. Performance of exterior windows, curtain walls when impacted by wind-borne debris per ASTM E1996, Level D
 - q. IES LM-44-90 Testing for Total and Diffused Reflectometry (Diffused Light Transmission)
 - r. [ASTM E108, FM 4470, NFPA 256, UBC 32-7, ULC-S107, UL 790 - Class A, Class B or Class C Roof Construction - Optional.]
- E. Maintenance Data: Submit from manufacturer recommended maintenance procedures, schedule of maintenance, and materials required or recommended for maintenance.
- F. Source Quality Control:
 - 1. Materials specified are type of materials to be used for this Project, and are based on performance characteristics of system specified.
 - 2. Alternate manufacturers must obtain approval min. 10 business days before Bid Opening by making full submittals as specified for translucent assembly.
 - 3. No changes of materials specified will be allowed after Bid Opening Date.
 - 4. Failure of translucent assembly to comply with all requirements of this Section will result in forfeiture of Bid Award.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer:
 - a. Engage experienced Installer who has successfully completed installation of translucent assemblies similar in material, design, and extent to that indicated for Project, factory-approved and in business of erecting similar material for at least 5 consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.
 - b. Submit list of at least five completed projects of similar nature and scope, including Project Name, Location, and Architect.
 - 2. Manufacturer:
 - a. Regularly engaged in translucent assemblies and able to demonstrate successful performance on comparable projects.
 - b. Responsibility shall also include design, furnishing and installing anchor assemblies, support framing, related connections, and fasteners as required for compliance with specified performance data.
 - c. Materials and Products manufactured by company continuously and regularly employed in manufacture of translucent assemblies using polycarbonate (not glass) panel systems for period of at least 10 years.
 - d. Submit list of at least 10 projects having been in place minimum of 10 years, with similar size, scope, climate, and type.
 - e. Manufacturer shall be responsible for configuration and fabrication of complete translucent assembly, and ensure that it fully meets all requirements of this Section.
 - 3. Engineer: Professional engineer licensed to practice in jurisdiction where Project is located, experienced in providing engineering services of kind indicated which has resulted in successful installation of translucent assemblies similar in material, design, and extent to that indicated for this Project.
- B. Translucent assembly must be evaluated and listed by recognized building code authorities:

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1. International Council Evaluation Service Inc (ICC-ES).
2. SBCCI - Public Safety Testing and Evaluation Services Inc.

1.05 WARRANTY

- A. Special Product Warranty:
1. Submit single source written warranty, executed by Manufacturer, agreeing to repair or replace translucent assemblies or components that fail in materials or installation within specified warranty period; third party warranty for glazing panels shall not be acceptable.
 2. Failures include, but are not limited to:
 - a. Structural failures.
 - b. Abnormal deterioration of metals, metal finishes and other materials beyond normal weathering.
 - c. Uncontrolled leakage.
 - d. Sealant failure.
 - e. Failure of assemblies to meet performance requirements.
 - f. Change in light transmission of no more than 6 percent per ASTM D1003.
 - g. No delamination of glazing panel affecting appearance, performance or structural integrity of panel or system.
 - h. Thermal aging - light transmission and color shall not change after exposure to heat of 300 deg.F for 25 minutes, measured per ASTM D1003 and ASTM D2244 respectively).
- B. Warranty period is min. 15 years after Substantial Completion.
- C. This warranty shall be in addition to, and not limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. Translucent Panels:
1. General:
 - a. Integral extruded structural core, with panel exterior skins connected with supporting continuous ribs, perpendicular to skins, at max. 0.18 in. (truss-like construction) with space between two exterior skins divided by multiple parallel horizontal surfaces, at max. 0.18 in spacing= do not use wide cell technology (cell size exceeding 0.18 in.).
 - b. Provide panels that are of polycarbonate resin with permanent, co-extruded, ultra-violet protective layer; do not use post-applied coating or films of dissimilar materials or fiberglass skins are unacceptable.
 - c. UV Maintenance: Ensure that system does not require any scheduled re-coating to maintain its performance or for UV protection.
 - d. Provide panels that are factory sealed at sill to restrict dirt ingress.
 2. Appearance:
 - a. Panel Assembly Thickness: Min. 2-3/4 in. panel with concealed interlocking battens.
 - b. Panel Width: Max. 2 ft. to ensure best performance for wind uplift, vibration, oil canning, and visual appearance; panels exceeding 2 ft. width will not be approved.
 - c. Uniform in color with integral core, having cross-section core constructed not to exceed 0.18 in. x 0.18 in.
 3. Thermal and Solar Performance:
 - a. Insulation Value: R-7.

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- b. Light Transmission (L.T.%): Min. 25 percent per ASTM E972, E1175, or D-1003.
- c. Solar Transmission (S.T.): Per ASTM E1084 at α_{normal} (90 degree) incidence angle.
- 4. Color: As selected by Architect.
- 5. Translucent Panel Joint System:
 - a. Extrude panel in one single formable length, with max. panel width of exceed 2 ft.; transverse connections are not acceptable.
 - b. Manufacture panels with grip-lock double tooth upstands integral to unit, with upstands at 90 degrees to panel face (standing seam dry glazed concept); welding or gluing of upstands or standing seam is not acceptable.
 - c. Ensure battens have grip-lock double tooth locking mechanism to ensure maximum uplift capability.
 - d. Metal Retention Clip: Configure with 0.4 in. wide top flange that extends continuously across web from end to end and from side to side and tested to allow safety factor for wind uplift of 90 psf per ASTM E330.
 - e. Ensure panel system connection meet wind load performance requirements without deterioration after 100 months of Florida outdoor exposure, with this performance demonstrated by providing independent lab comparison test reports for weathered versus new panel assembly; as standard for all systems, provide test reports for 16mm panel assembly, 6 ft. wide x 12 ft. long that have been exposed to Florida weather conditions for 100 months per ASTM E330 for loading, ASTM E1886 for cycling and ASTM E19962 for missile impact at design load of 70 PSF.
 - f. Water Penetration: No water penetration of panel U/H joint connection length at test pressure of 10.0 PSF per ASTM E331.
 - g. Free movement of panels shall be allowed to occur without damage to weather tightness of completed system.
- 6. Flammability:
 - a. Exterior and interior faces shall be approved light transmitting panel with CC1 fire rating classification per ASTM D635, having flame spread no greater than 25 per ASTM E84, smoke density no greater than 75 per ASTM D2843, and minimum self-ignition temperature of 1000 deg.F per ASTM F1929, fully self-extinguishing.
 - b. Interior Flame Spread Classification: Class I per ASTM E84.
 - c. Rate standard Quadwall configuration Class C per ASTM E108, FM 4470, NFPA 256, UBC 32-7, ULC-S107, UL 790 roof construction.
 - d. Provide translucent panel successfully evaluated for fire from exterior exposure per ASTM E108, FM 4470, NFPA 256, UBC 32-7, ULC-S107, UL 790 to meet Class A rating, with panel listed by independent recognized listing laboratory.
- 7. Impact Resistance: Ensure panels pass following tests:
 - a. ASTM D3841/SPI - Impact and Shatter Resistance of 200 ft. lbs.
 - b. SFBC B PA 201, impact resistance of 350 ft. lbs.
 - c. ASTM E1996 - Must comply with standard specification for performance of exterior windows or curtain walls when impacted by windborne debris at level D and after cyclic wind loading at specified design load.
- 8. OSHA Life Safety Standards:
 - a. Complies with 29 CFR 1926.502 (i)(2) and 29 CFR 1910.23 (e)(8).
 - b. Panel assembly shall withstand impact loading by blunt object of 500 ft. lbs. per ASTM E695.
 - c. Panel assembly withstands 300 lb. point load at 5 ft. span per OSHA standard 29CFR 1910 23e8.
- 9. Hurricane Zone Panel System: Comply with meet wind uplift resistance requirements per ASTM E1996 and/or Dade County test protocols PA 201, PA 202, PA 203, min. 100 mph wind load.

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10. Cyclic Wind Load: Test panels for cyclic wind loads and impact resistance per ASTM E1886 and ASTM E1996 at test load to verify positive and negative design loads and level D impact.
 11. Weatherability:
 - a. Measure light transmission by ASTM D1003, to not decrease more than 6 percent over 10 years, or after exposure to temperature of 300 deg.F for 25 minutes (thermal aging).
 - b. Ensure that panel has been tested by recognized laboratory for weathering evaluation per ASTM D4364 (EMMAQUA, UNBACKED), after exposure to minimum concentrated natural sunlight radiation of 56000 MJ/M (1540 MJ/M of UV, 200 B 385 N.M) and that panel does not change in color more than 4.0 units Delta E, 4.0 units Delta L and Delta B.
 - c. Ensure that panel does not change color more than 4.0 units (DELTA-E by ASTM D2244) after 60 months outdoor weathering in Arizona determined by average of at least two samples.
 - d. Thermal Aging: Ensure that interior and exterior faces do not change color in excess of 0.75 Delta E by ASTM D2244 and shall not darken more than 0.3 units (Delta L by ASTM D2244) and 0.2 units Delta Y (YI) by ASTM D1925 and shall not show cracking or crazing when exposed to 300 deg.F for 25 minutes.
 - e. Ensure that faces do not become readily detached when exposed to temp of 300 deg.F and 0 deg.F for 25 minutes.
- B. Metal Frame Structure:
1. To meet ANSI/ASCE 75 building design load per code.
 2. Engineer translucent assembly to be self-supporting between support constructions.
 3. Provide deflection of structural framing members in direction normal to plane of glazing, when subjected to uniform load deflection to max. L/60 for unsupported span, ensuring that translucent assembly will impose reactions to support construction.
 4. Provide adjacent and support construction to support transfer of all loads including horizontal and vertical, exerted by translucent assembly.
 5. Water Penetration: No water penetration at minimum differential static pressure of 6.24 lbs. per sq. ft. per AAMA 501, Pressure Difference Recommendations and as demonstrated by prior testing of typical framing sample per ASTM E331.
 6. Water test of metal frame structure shall be conducted according to procedures in AAMA 501.2
 7. Extruded Aluminum: ANSI/ASTM B221; 6063-T6; 6063-T5, or 6005-T5.
 8. Flashing:
 - a. 5005 H34 aluminum, 0.04 in. minimum thickness.
 - b. Furnish sheet metal flashings/closures/claddings as shop formed to profile when lengths exceed 10 ft. in nominal 10 ft. lengths.
 - c. Field trimming of flashing and field forming ends is necessary to suit as-built conditions.
 - d. Overlap sheet metal ends at least 6 in. to 8 in., set in full bed of sealant and riveted, as required.
 9. Provide all Fasteners for aluminum framing of stainless steel, excluding final fasteners to building.
 10. Finish: All exposed aluminum finish shall be standard color CPICRF Custom Paint, as selected by Architect.
- C. Product: CPI Daylighting, Inc. Model Translucent Insulating Interlocking Nano-Cell Glazing Technology (it has been shown to be in the public interest that no substitutions for this product are allowed).

PART 3 EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
 - 4. Rigidly-secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- B. Metal Protection: Where aluminum will contact dissimilar materials, protect against galvanic action by painting contact surfaces with bituminous paint or by installing nonconductive spacers as recommended in writing by manufacturer for purpose.
- C. Install components plumb and true in alignment with established lines and elevations.
- D. Erection Tolerances:
 - 1. Install translucent assembly components in plane, plumb, level, accurately aligned, and correctly located in reference to building features and without warpage or racking.
 - 2. Adjust framing to conform to following tolerances:
 - a. Plumb: 1/8 in. in 10 ft., 1/4 in. in 40 ft.
 - b. Level: 1/8 in. in 20 ft., 1/4 in. in 40 ft.
 - c. Alignment: Limit offset from true alignment between two members abutting end-to-end, edge-to-edge in line, or separated by less than 3 in. to less than 1/32 in.
 - d. Location: Install framing with maximum deviation from measured theoretical plane or location of any member at any location to 1/8 in. per 12 ft. of length or 1/2 in. total length.

3.02 CLEANING

- A. Cleaning:
 - 1. Clean metal and glazing material of completed translucent assemblies, inside and outside, during or promptly after erection, allowing for nominal curing of liquid sealants.
 - 2. Remove temporary protective coverings and strippable coatings from prefinished metal surfaces.
 - 3. Remove labels and part number markings from all components.
 - 4. Wash-down exposed surfaces with soft clean cloths using solution of mild detergent in warm water, then wipe clean.
 - 5. Take care to clean member connections and inside corners.
 - 6. Avoid use of harsh cleaning materials and methods that would damage metal finishes or glazing.
- B. Remove remaining excess sealant by moderate use of solvent acceptable to sealant manufacturer.
- C. Follow recommendations of translucent assembly manufacturer for proper and adequate protection and cleaning procedures during remainder of construction period, so that system will be without damage at time of Acceptance.
- D. Demonstrate proper cleaning methods and materials to Owner's maintenance personnel.

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- E. Clean translucent assembly thoroughly at Substantial Completion.

END OF SECTION

SECTION 085113

ALUMINUM WINDOWS

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 SUMMARY

- A. Section Includes: Work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.
1. Replacement of existing exterior windows including, but not limited to:
 - a. Removing existing windows from building window openings.
 - b. Removing existing window installation materials (including blocking and nailers) from building window openings.
 - c. Disposal of all existing windows and window installation materials in compliance with 310 CMR 19.017 as work progresses.
 - d. Providing protection to existing materials to remain.
 - e. Erecting and maintaining temporary weather and security protection at window openings where new window units are not installed by end of work day or when inclement weather threatens.
 2. Preparing openings to receive new exterior windows, consisting of:
 - a. Clean opening of existing window after all removals are completed.
 - b. Placing new blocking required for new window installation.
 3. Providing (furnishing and installing) new window units complete with factory glazing and insect screens to include:
 - a. Projected windows (project-inoppers), complete with handle operators.
 4. Installation of sill flashing and shims as new window units are installed.
 5. Installation of new insect screens and frames (full size of window unit) for operable sash window units as window units are installed.
 6. Factory-installed insulated FRP Faced panel glazing and drainable blade louvers, in addition to standard factory-installed glazing.
 7. Work of this Section to include field verification of all existing dimensions before submission of shop drawings or beginning fabrication of windows for this Project.
- B. Related Sections:
1. 028000, Asbestos Abatement.
 2. 028433, Removal and Disposal of Polychlorinated Biphenyls, for surface preparation and precautions associated with fastening through remediated surfaces.
 3. 079200, Joint Sealants; for sealing perimeter of frames to adjoining construction.
 4. 062000, Finish Carpentry; for repair of interior window trim where damaged due to work of Section 085113.

1.02 SYSTEM DESCRIPTION

- A. System Performance:
1. Provide window units complying with performance requirements specified, as demonstrated by testing according to test methods indicated in ANSI/AAMA 101 and ASHRAE 90.1 (with requirements to meet or exceed NFRC and EnergyStar as specified in this Section).

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2. Design Requirements:
 - a. Comply with structural performance, air infiltration, and water penetration requirements indicated in ANSI/AAMA 101 for type, grade, and performance class of window units specified.
 - b. Provide window units capable of withstanding pressures for type, grade, and performance class of window unit specified as minimum and increase grade and performance class using final shop submittal calculations to conform to code requirements.
 3. Engineering Responsibility: Engage fabricator who assumes undivided responsibility for engineering window unit by employing qualified professional engineer to prepare design calculations, shop drawings, and other structural data.
 4. Thermal Transmittance: NFRC 100 (Windows 5.2/THERM 5.2 Computer Program) maximum whole-window U-factor and EPA EnergyStar 2010 of:
 - a. North Climate Zone: 0.30 Btu/sq. ft. x h x deg.F.
 5. Solar Heat-Gain Coefficient (SHGC): NFRC 200 (Windows 5.2/THERM 5.2 Computer Program) maximum whole-window SHGC and EPA EnergyStar 2010, of:
 - a. North Climate Zone: 0.37.
 6. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503
 7. Thermal Movements:
 - a. Provide aluminum windows, including anchorage, that allow for thermal movements resulting from maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.
 - b. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 8. Sound Transmission Class (STC): Rated for not less than 30 STC when tested for laboratory sound transmission loss according to ASTM E90 and determined by ASTM E413.
 9. The existing windows shall be replaced with new thermally-broken, aluminum windows with insulating glass, and a maximum U- value of 0.45 and maximum U- Value of 0.42 for storefront system.
- B. Life-Cycle Testing: Test according to AAMA 910 and comply with AAMA/NWWDA 101/I.S.2.
1. Projected Windows: Comply with AAMA/NWWDA 101/I.S.2 for following tests.
 - a. Hardware Load Test.
 - b. Sash Torsion Test.
 - c. Torsion Test.
 - d. Horizontal Concentrated Load Test on Latch Rail.
 - e. Vertical Concentrated Load Test on Latch Rail.
 - f. Torsion Load Test on Intermediate Frame Rails.
 - g. Vertical Concentrated Load Test on Intermediate Frame Rails.
 - h. Balance Arm Load Test.
- C. Test Performance:
1. Windows shall conform to all AAMA/WDMA/CSA 101/I.S.2/A440-08 requirements for window type.
 2. Air Infiltration Test: With ventilators closed and locked, test unit in accordance with ASTM E283 a static air pressure difference of 6.24 psf, with air infiltration not to exceed 0.10 cfm per sq. ft.
 3. Water Resistance Test: With ventilators closed and locked, test unit in accordance with ASTM E331/ASTM E 547 at static air pressure difference of 15.0 psf, with no uncontrolled water leakage.

4. Uniform Load Deflection Test: With ventilators closed and locked, test unit in accordance with ASTM E330 at static air pressure difference of 120.0 psf, positive and negative pressure, no member shall deflect over $L/175$ of its span.
5. Uniform Load Structural Test: With ventilators closed and locked, test unit in accordance with ASTM E330 at static air pressure difference of 135.0 psf, both positive and negative, there shall be no glass breakage at conclusion of test and no permanent damage to fasteners, hardware parts, support arms or actuating mechanisms, nor any other damage that would cause window to be inoperable.
6. Forced Entry Resistance: Test in accordance to ASTM F588 to meet requirements of performance grade 40.
7. Condensation Resistance Test (CRF): With ventilators closed and locked, test unit in accordance with AAMA 1503.09 resulting in CRF of not be less than 67 (frame) and 71 (glass) when glazed with 2 in. insulated \pm 1/4 in. clear low emissivity, 5/8 in. air space, 1/4 in. clear glass.
8. Thermal Transmittance Test (Conductive U-Value): With ventilators closed and locked, test unit in accordance with AAMA 1503.09 resulting in U-Value of 0.33 BTU/hr/sf x h x deg. F when glazed with 2 in. insulated with 1/4 in. clear low emissivity, 5/8 in. air space, 1/4 in. clear glass.

1.03 SUBMITTALS

- A. Product Data: Provide for each type of window required, including construction details and fabrication methods; profiles and dimensions of individual components; data on hardware, accessories, and finishes; and recommendations for maintenance and cleaning of exterior surfaces.
- B. Shop Drawings:
 1. General:
 - a. Window installer shall ensure that all details and elevation bear dimensions of actual measurements taken in field by window installer.
 - b. Window installer shall ensure that all shop drawings and details show proposed surrounding construction, including flashing.
 - c. Do not resubmit architect prepared drawings and details as shop drawing submittals; window installer shall ensure that all shop drawing submittals are prepared as originals for this Project.
 2. Include plans and elevations to min. 1/4 in. = 1 ft., and sections and details to min. 3/4 in. = 1 ft., complete with hardware and attachments to other work, operational clearances, and following.
 - a. Mullion details, including reinforcement and stiffeners.
 - b. Joinery details.
 - c. Expansion provisions.
 - d. Flashing and drainage details.
 - e. Weatherstripping details.
 - f. Thermal-break details.
 - g. Glazing details.
 - h. Window cleaning provisions.
 - i. Window System Operators: Show locations, mounting, and details for installing operator components and controls.
 - j. Show reinforcing channels, opening framing, supplemental framing, splices, accessories, connection details, and attachments to other units of work.
 3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by qualified professional engineer responsible for their preparation and used to determine following:
 - a. Structural test pressures and design pressures from basic wind speeds indicated.
 - b. Deflection limitations of glass framing systems.

- C. Samples:
 - 1. Initial Color Selection:
 - a. Submit samples of each specified finish on 12 in. long sections of window members.
 - b. Where finishes involve normal color variations, include sample sets showing full-range of variations expected.
 - 2. Verification Purposes: Architect reserves right to require additional samples that show fabrication techniques and installation and design of hardware and accessories.
- D. Certification: Provide certification by recognized independent testing laboratory or agency showing each type, grade, and size of window unit complies with performance requirements indicated.
- E. Material Test Reports:
 - 1. Engage recognized independent testing laboratory or agency to perform tests specified.
 - 2. Provide certified test results showing each type, grade, and size of window unit complies with performance requirements indicated.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Installer: Engage experienced installer who has completed installation of aluminum windows similar in design and extent to those required for Project and whose work has resulted in construction with record of successful in-service performance.
- B. Standards: Requirements for aluminum windows, terminology and standards of performance, and fabrication work are those specified and recommended in ANSI/AAMA 101 and other applicable recommendations published by AAMA.
- C. Single-Source Responsibility: Provide window units from one source and produced by single manufacturer for each ANSI/AAMA 101 Performance Rating and finish specified in this Section.

1.05 PROJECT CONDITIONS

- A. Field Measurements:
 - 1. Window installer shall check actual window openings by accurate field measurement before fabrication.
 - 2. Show recorded measurements on final shop drawings.
 - 3. Coordinate fabrication schedule with construction progress to avoid delay of work.
 - 4. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit of window units.

1.06 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace aluminum windows that fail in materials or fabrication quality within specified warranty period with failures to include, but not limited to, following:
 - 1. Failure to meet performance requirements.
 - 2. Structural failures, including excessive deflection.
 - 3. Water leakage, air infiltration, or condensation.
 - 4. Faulty operation of movable sash and hardware.
 - 5. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

6. Insulating glass failure.
- B. Warranty Period:
1. Window: 10 years from date of Substantial Completion.
 2. Glazing Units: 5 years from date of Substantial Completion.
 3. Aluminum Finish: 10 years from date of Substantial Completion.
- C. Warranty shall not deprive Owner of other rights or remedies Owner may have under other provisions of Contract Documents, and is in addition to and runs concurrent with other warranties made by Contractor and under requirements of Contract Documents.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Window Units: Graham Architectural Products Corp. Models 17202 - Hopper/Fix, or approved equal from alternative acceptable manufacturers.
- B. Acceptable Manufacturers: Graham Architectural Products Corp., EFCO Corporation (a Pella Company), TRACO, Wausau Window and Wall Systems.

2.02 MATERIALS

- A. Wood Blocking, Shims, and Nailers:
1. Provide wood for support or attachment of other work including cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
 2. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
 3. Moisture content: Max. 19 percent for lumber items not specified to receive preservative treatment.
 4. Grade: Standard Grade light framing size lumber of any species or board size lumber as required; No. 3 Common or Standard Grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.
 5. Preservative Treatment:
 - a. Where lumber or plywood is specified to be treated, comply with applicable requirements of AWP Standards C2, Lumber and C9, Plywood and of AWPB standards listed.
 - b. Mark each treated item with AWPB Quality Mark Requirements.
 - c. Pressure-treat above-ground items with waterborne preservatives to min. retention of 0.25 pcf.
 - d. For interior uses, after treatment, kiln-dry lumber and plywood to maximum moisture content, respectively, of 19 percent and 15 percent.
 - e. Complete fabrication of treated items before treatment, where possible.
 - f. If cut after treatment, coat cut surfaces to comply with AWPB M4.
 - g. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
- B. Temporary Weather/Security Protection:
1. Cut plywood panel min. 12 in. wider than opening to overlap min. 6 in. on each side and min. 6 in. longer to overlap head of opening.
 2. Cover plywood to remain in place more than 24 hrs. with building paper applied in shingle-fashion, wrapped over edges, stapled to plywood.
 3. Secure plywood to exterior of opening using carriage bolts placed through predrilled holes to retainer 2x4 wood braces.
 4. Provide 2x4 wood braces spaced horizontally 6 in. from bottom and top of opening, with narrow face of 2x4 placed against opening.

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5. Provide 2x4 of sufficient length to overlap side of opening min. 6 in. on each side and slide on carriage bolts, fastening with large fender washers and nuts.
 6. Provide additional 2x4 wood brace at 24 in. o.c. for any opening greater than 48 in. in height.
- C. Frames and Sashes:
1. Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.
 2. Thermally Improved Construction: Fabricate frames, sashes, and muntins with integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in manner that eliminates direct metal-to-metal contact.
- D. Glazing System:
1. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
 2. Glass:
 - a. Clear annealed glass, ASTM C1036, Type 1, Class 1, q3.
 - b. Kind: Fully tempered, where indicated on Drawings.
 3. Insulating-Glass Units:
 - a. ASTM E2190, certified through IGCC as complying with requirements of IGCC.
 - b. Glass: ASTM C1036, Type 1, Class 1, q3.
 - c. Tint: Clear.
 - d. Kind: Fully tempered, where indicated on Drawings.
 - e. Lites: Two.
 - f. Filling: Fill space between glass lites with argon.
 - g. Low-E Coating: Pyrolytic on second surface or sputtered on second surface.
- E. Insulated Panels:
1. Type: FRP-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.
 2. Overall Panel Thickness: 1 in.
 3. Exterior Skin: FRP.
 - a. Thickness: Manufacturer's standard for finish and texture indicated; min. 0.120 in. thick.
 - b. Finish: Color as selected by Architect.
 - c. Texture: Smooth.
 4. Interior Skin: Aluminum.
 - a. Thickness: Manufacturer's standard for finish and texture indicated.
 - b. Finish: Matching window framing.
 - c. Texture: Smooth.
 - d. Backing Sheet: 1/8 in. thick, tempered hardboard.
 5. Thermal Insulation Core: Manufacturer's standard rigid insulation.
 6. Surface-Burning Characteristics: For exposed interior surfaces of panels, when tested according to ASTM E84 as follows:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
- F. Louver Units:
1. Type: Horizontal, drainable-blade louver.
 2. Louver Depth: 1 in. to fit frame same as insulated glass unit.
 3. Frame and Blade Nominal Thickness: Not less than 0.080 in.
 4. AMCA Seal: Mark units with AMCA Certified Ratings Seal.
- G. Heavy-Duty Screens:
1. Aluminum Extrusions: All frame and retainer sections shall be extruded aluminum

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shapes produced from commercial quality 6063-T5 alloy and shall be free from defects that impair strength and durability.

2. Screen frames fabricated with double hollows and nominal 0.078 in. wall thickness with min. 1 in. space from the glass surface for screen mesh.
3. No exposed fasteners to the exterior will be acceptable.
4. Mesh: 12-mesh 0.023 in. dia. stainless steel; powder coat for solid black color.
5. Screen Assembly Finish: Match exterior window finish.

H. Hardware:

1. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.
2. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
3. Projected Window Hardware (Project-In Hoppers):
 - a. Handle (lever) actuated operation and latching, function without requiring removal of exterior screens, cast white bronze.
 - b. Hinges: Non-friction type, not less than two per sash.
 - c. Limit Devices: Concealed friction adjustor, adjustable stay bar, designed to restrict sash opening to 4 in. with custodial key release.

I. Fasteners:

1. Stainless steel compatible with window members, trim, hardware, anchors, and other components.
2. Exposed Fasteners:
 - a. Do not use exposed fasteners to the greatest extent possible.
 - b. For application of hardware, use fasteners that match finish hardware being fastened.

J. Interior Joint Sealants:

1. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
2. Sealant Color: Use sealant as selected from manufacturer's standard colors unless special colors are shown or specified.
3. Elastomeric Joint Sealant:
 - a. Type S, Grade NS, Class 25, and Uses NT, M, A, and, as applicable to joint substrates indicated, O.
 - b. Product: Bostik Construction Products Division Model Chem-Calk 900, Mameco International Inc. Model Vulkem 116, Pecora Corp. Model Dynatrol I, Sika Corp. Model Sikaflex-1a NS, Tremco Inc. Model Dymonic.
4. Elastomeric Tubing Joint Fillers:
 - a. Neoprene, butyl, or EPDM tubing complying with ASTM D1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg. F (-15 deg.C).
 - b. Provide products with low compression set and of size and shape to provide secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
5. Bond-Breaker Tape:
 - a. Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back, third surface, of joint.
 - b. Provide self-adhesive tape where applicable.
6. Primer: Provide type recommended by sealant manufacturer where required for

adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer-substrate and field tests.

7. Cleaners for Nonporous Surfaces: Provide nonstaining chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials that are not harmful to substrates and adjacent nonporous materials.
8. Masking Tape: Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

2.03 FABRICATION

A. General:

1. Fabricate aluminum windows in sizes indicated.
2. Include complete system for assembling components and anchoring windows.
3. Glaze aluminum windows in factory.
4. Weather strip each operable sash to provide weathertight installation.
5. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
6. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.
7. Mullions:
 - a. Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units.
 - b. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated.
 - c. Provide mullions and cover plates capable of withstanding design wind loads of window units.
8. Complete fabrication, assembly, finishing, hardware application, and other work in factory to greatest extent possible.
9. Disassemble components only as necessary for shipment and installation.

B. Window Performance Requirements: Comply with following requirements, which are shown as minimum acceptable for work of this Project.

1. Projected Windows (Project-In Hoppers):
 - a. AAMA RATING & TEST SIZE: AP-AW90 60 x 72
 - b. AIR (cfm/ft²) at 50 mph: 0.1
 - c. WATER (psf): 12
 - d. DESIGN PRESSURE (psf): 90
 - e. UNIFORM LOAD STRUCTURAL (psf): 142
 - f. U-VALUE (Btu/hr/ft²/x deg.F) - Low-E Glass: 0.4

C. Aluminum Finish:

1. General:
 - a. Comply with NAAMM Metal Finishes Manual for recommendations relative to application and designations of finishes.
 - b. Finish designations prefixed by "AA" conform to system established by Aluminum Association for designating aluminum finishes.
2. High-Performance Organic Coating (Kynar 500): AA-C12C42R1x.
 - a. Chemical Finish: Chemical conversion coating, acid-chromate-fluoride-phosphate pretreatment.
 - b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
 - c. Fluorocarbon 2-Coat Coating System: Manufacturer's standard 2-coat thermocured system, composed of specially-formulated inhibitive primer and fluorocarbon color topcoat containing min. 70 percent polyvinylidene fluoride resin by weight; comply with AAMA 605.2.
 - d. Color and Gloss: As selected by Architect.

PART 3 EXECUTION

3.01 INSPECTION

- A. General:
 - 1. Inspect openings before beginning installation.
 - 2. Verify opening is correct and sill plate is level.

3.02 PREPARATION

- A. Removal of Existing Windows and Protection of Work:
 - 1. Do not start window removal until new windows and accessories are delivered to site, and especially placement of roof protection before performing any work related to clerestory windows.
 - 2. Furnish, install, and maintain, for duration of work, substantial dustproof temporary coverings and protection for existing interior and exterior work and furnishings to remain.
 - 3. Be fully prepared to install new window unit, complete with blocking and related window trim and accessories immediately into existing openings as existing window is removed.
 - 4. Do not remove more windows than can be replaced with new windows complete and weathertight in place with insect screens.
 - 5. Remove all debris daily from site, including removed window materials and accessories.
- B. Temporary Weather/Security Protection: Erecting and maintaining temporary weather and security protection at window openings where new window units are not installed by end of work day or when inclement weather threatens.
- C. Wood Nailers and Blocking:
 - 1. Provide wherever shown and where required for attachment of other work.
 - 2. Form to shapes as shown and cut as required for true line and level of work to be attached.
 - 3. Coordinate location with other work involved.
 - 4. Attach to substrates as required to support applied loading.
 - 5. Countersink bolts and nuts flush with surfaces.
- D. Predrill at masonry for anchoring windows under full containment and requirements specified in Section 028433.

3.03 INSTALLATION

- A. Window Units:
 - 1. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of work.
 - 2. Set units plumb, level, and true to line, without warp or rack of frames or sash.
 - 3. Provide proper support and anchor securely in place, using shims as required for proper installation.
 - 4. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in ANSI/AAMA 101 Appendix.
 - 5. Sill Flashing:
 - a. Fabricate flashing with drip edge by extending flashing 1/2 in. out from window, with outer edge bent down 30 degrees and hemmed.
 - b. Prepare masonry surfaces so they are smooth and free from projections that

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- could puncture flashing.
- c. Extend flashing into window extrusion.
- d. Turn up at ends min. 2 in. to form end dams.
- e. Do not block internal moisture control openings in window unit.

B. Interior Joint Sealants at New Window Units:

1. Surface Cleaning of Joints:
 - a. Clean out joints immediately before installing joint sealers to comply with recommendations of sealant manufacturers and following requirements.
 - b. Remove all foreign materials from joint substrates that could interfere with adhesion of joint sealer, including dust; paints, except permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water-repellant; water; surface dirt; and frost.
 - c. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
2. Joint Priming:
 - a. Prime joint substrates where indicated or where recommended by sealant manufacturer based on preconstruction joint sealer-substrate tests or prior experience.
 - b. Apply primer to comply with sealant manufacturer's recommendations.
 - c. Confine primers to area of joint sealer bond.
 - d. Do not allow spillage or migration to adjoining surfaces.
3. Masking Tape:
 - a. Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.
 - b. Remove tape immediately after tooling without disturbing joint seal.
4. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C962 for use of joint sealants as applicable to materials, applications, and conditions indicated.
5. Sealant Backings:
 - a. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - b. Do not leave gaps between ends of joint fillers.
 - c. Do not stretch, twist, puncture, or tear joint fillers.
 - d. Remove absorbent joint fillers that have become wet before sealant application and replace with dry materials.
 - e. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where required to prevent third side adhesion of sealant to back of joint.
 - f. Install compressible seals serving as sealant backings to comply with requirements indicated for joint fillers.
6. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
7. Tooling of Nonsag Sealants:
 - a. Immediately after sealant application and before time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint.
 - b. Remove excess sealants from surfaces adjacent to joint.
 - c. Do not use tooling agents that discolor sealants or adjacent surfaces or are

- not approved by sealant manufacturer.
- d. Provide concave joint configuration per Figure 6A in ASTM C962, unless otherwise indicated.
- e. Use making tape to protect adjacent surfaces of recessed tooled joints.
- 8. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.
- 9. Protection:
 - a. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so they are without deterioration or damage at time of Substantial Completion.
 - b. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

3.04 FIELD QUALITY CONTROL

- A. Testing Agency:
 - 1. Engage qualified testing agency to perform tests and inspections.
 - 2. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
 - 3. Water-Resistance Testing:
 - a. Test Pressure: 2/3 times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
 - 4. Testing Extent:
 - a. 3 windows of each type as selected by Architect and qualified independent testing and inspecting agency.
 - b. Windows shall be tested after perimeter sealants have cured.
 - 5. Test Reports: Prepared according to AAMA 502.
- C. Remove and replace noncomplying windows and retest as specified above.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.05 ADJUSTING AND CLEANING

- A. Adjust operating sash and hardware to provide tight fit at contact points and at weatherstripping, and to ensure smooth operation and weathertight closure.

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B. Cleaning:

1. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.
2. Remove excess glazing and sealant compounds, dirt, and other substances.
3. Lubricate hardware and moving parts.
4. Clean glass of window units promptly after installation of windows.

3.06 PROTECTION

- A. Initiate and maintain protection and other precautions required to ensure window units will be without damage or deterioration, other than normal weathering, at time of Acceptance.

END OF SECTION

SECTION 099100

PAINTING

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 SUMMARY

- A. Section Includes: Work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.
 - 1. Surface preparation, painting, and finishing of exposed interior and exterior items and surfaces whether new or existing surfaces with existing surfaces prepared, painted, and finished to extent indicated and scheduled on Drawings.
 - 2. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified under other Sections.
 - 3. Surface preparation includes all necessary work specified in this Section (e.g., such as filling nail holes) required to provide surface suitable for application of primers and other applied materials, whether used as prime, intermediate, or finish coats.
 - 4. Exposed Surfaces:
 - a. Where item or surface is not specifically mentioned, paint same as similar adjacent materials or surfaces.
 - b. If color or finish is not designated, Architect will select from standard colors or finishes available.
 - 5. Include painting of existing masonry to extent indicated on Drawings, but not less than 1 in. on exterior and 1 in. on exterior on either side of window plane.
- B. Definitions:
 - 1. Paint includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.
 - 2. Standard Coating Terms: As defined in ASTM D16 apply to this Section.
 - a. Flat: Refers to lusterless or matte finish with gloss range below 15 when measured at 85 deg. meter.
 - b. Eggshell (Low Luster): Refer to low-sheen finish with gloss range between 15 and 35 when measured at 60 deg. meter.
 - c. Satin: Refer to low-sheen finish with gloss range between 15 and 35 when measured at 60 deg. meter.
 - d. Semigloss: Refer to medium sheen finish with gloss range between 30 and 65 when measured at 60 deg. meter.
 - e. Full-Gloss: Refers to high sheen finish with gloss range more than 65 when measured at 60 deg. meter.

1.02 SUBMITTALS

- A. Product Data: Provide for each paint system specified.
 - 1. Material List:
 - a. List each material and cross-reference specific coating and finish system and application.
 - b. Identify each material by manufacturer's catalog number and general classification.

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2. Manufacturers Information: Manufacturer's technical information, label analysis, and instructions for handling, storage, and application of each material proposed for use.

B. Samples for Initial Color Selections:

1. Submit in form of manufacturer's color charts to match existing.
2. After color selection, Architect will furnish color chips for surfaces to be coated.

1.03 QUALITY ASSURANCE

- A. Qualifications - Applicator: Engage experienced applicator who has completed painting system applications similar in material and extent to those indicated for Project resulting in construction record of successful in-service performance.

- B. Single-Source Responsibility: Provide primers and undercoat paint produced by same manufacturer as finish coats.

C. Field Samples:

1. On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples.
2. Provide full-coat finish samples on min. 100 sq. ft. of surface until required sheen, color, and texture are obtained.
3. Simulate finished lighting conditions for review of in-place work.
4. Final acceptance of colors will be from job-applied samples.
5. Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted.
6. Apply coatings in this room or surface in accordance with Schedule, or as specified.
7. After finishes are accepted, this room or surface will be used for evaluation of coating systems of similar nature.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and following information:

1. Product name or title of material.
2. Product description (general classification or binder-type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Storage:

1. Store materials not in use in tightly covered containers in well-ventilated area at min. 45 deg. F (7 deg.C) ambient temperature.
2. Maintain containers used in storage in clean condition, free of foreign materials and residue.
3. Protect from freezing.
4. Keep storage area neat and orderly.
5. Remove oily rags and waste daily.
6. Take necessary measures to ensure workers and work areas are adequately protected from fire and health hazards resulting from handling, mixing, and application.

1.05 PROJECT CONDITIONS

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- A. Environmental Requirements:
 - 1. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F (10 deg.C) and 90 deg. F (32 deg.C).
 - 2. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.
 - 3. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Zero VOC Architectural Coatings: American Formulating & Manufacturing (AFM), Home Depot (ICI Paints-Azko Nobel.
- B. Encapsulants: MAB Paints a business unit of the Sherwin-Williams Company) "Modac Coatings", Sika Group "Sika Gard Coatings"

2.02 MATERIALS

- A. Material Compatibility: Provide fillers, primers, finish coat materials, and related materials compatible with one another and substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Materials Quality: Paint material containers not displaying manufacturer's product identification will not be acceptable.
- C. Colors:
 - 1. Tint primers and undercoats to approximate shade of selected finish coat color.
 - 2. For deep-tone finish colors, use Deep-Base Primers recommended by manufacturer for surface.
 - 3. Color Selections:
 - a. If color is not listed for specific area or item, it does not relieve Contractor of responsibility for providing colors to be selected.
 - b. Color selection made by Architect is to determine basic color required for surface.
 - c. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 in. or more.
 - d. Final application of colors shall match prepared samples approved by Architect.
- D. Sustainability - VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Substrate:
 - 1. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint.
 - 2. Surfaces receiving paint must be thoroughly dry before paint is applied.
 - 3. Do not begin paint application until unsatisfactory conditions have been corrected.

4. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within particular area.

B. Coordination of Work:

1. Review other Sections in which primers are provided to ensure compatibility of total system for various substrates.
2. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
3. Notify Architect about anticipated problems using materials specified over substrates primed by others.

3.02 PREPARATION

A. General:

1. Remove hardware and hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place not to be painted, or provide surface-applied protection before surface preparation and painting.
2. Remove these items if necessary for complete painting of items and adjacent surfaces.
3. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in trades involved.

B. Cleaning:

1. Before applying paint or other surface treatments, clean substrates of substances that could impair bond of various coatings.
2. Remove oil and grease before cleaning.
3. Schedule cleaning and painting so dust and other contaminants from cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation:

1. Clean and prepare surfaces to be painted in accordance with manufacturer's instructions for each particular substrate condition and as specified.
2. Provide barrier coats over incompatible primers or remove and reprime.
3. Notify Architect in writing of problems anticipated with using specified finish-coat material with substrates primed by others.

D. Materials Preparation:

1. Mix and prepare painting materials in accordance with manufacturer's directions; use only thinners approved by paint manufacturer, and only within recommended limits.
2. Maintain containers used in mixing and application of paint in clean condition, free of foreign materials and residue.
3. Stir materials before application to produce mixture of uniform density, and stir as required during application.
4. Do not stir surface film into material.
5. Remove film and, if necessary, strain material before using.

E. Tinting:

1. Tint each undercoat lighter shade to facilitate identification of each coat where multiple coats of same material are applied.
2. Tint undercoats to match color of finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.03 APPLICATION

A. General:

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1. Apply paint according to manufacturer's directions.
 2. Use applicators and techniques best suited for substrate and type of material being applied.
 3. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of durable paint film.
 4. Provide finish coats compatible with prime paints used.
 5. Number of coats and film thickness required is same regardless of application method.
 6. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 7. Sand between applications where sanding is required to produce even, smooth surface in accordance with manufacturer's directions.
 8. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color, and appearance.
 9. Ensure surfaces, including edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
- B. Scheduling Painting:
1. Apply first-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 2. Allow sufficient time between successive coatings to permit proper drying.
 3. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of undercoat.
- C. Application Procedures:
1. Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's directions.
 2. Brushes: Use brushes best suited for material applied.
 3. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 4. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness:
1. Apply materials at not less than manufacturer's recommended spreading rate.
 2. Provide total dry film thickness of entire system as recommended by manufacturer.
- E. Prime Coats:
1. Before application of finish coats, apply prime coat to material required to be painted or finished, and that has not been prime coated by others, except use full specified coating system for high-performance architectural opaque coating systems.
 2. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure finish coat with no burn-through or other defects due to insufficient sealing.
- F. Pigmented (Opaque) Finishes:
1. Completely cover to provide opaque, smooth surface of uniform finish, color, appearance and coverage.
 2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- G. Completed Work:
1. Match approved samples for color, texture and coverage.
 2. Remove, refinish or repaint work not in compliance with specified requirements.

3.04 FIELD QUALITY CONTROL

A. Testing:

1. Owner reserves right to invoke following material testing procedures at any time, and any number of times, during period of field painting.
2. Owner will engage service of independent testing laboratory to sample materials being used.
3. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
4. Testing laboratory will perform appropriate tests for following characteristics, as required by Owner:
 - a. Quantitative materials analysis.
 - b. Abrasion-resistance.
 - c. Apparent reflectivity.
 - d. Flexibility.
 - e. Washability.
 - f. Absorption.
 - g. Accelerated weathering.
 - h. Dry opacity.
 - i. Accelerated yellowness.
 - j. Recoating.
 - k. Skinning.
 - l. Color retention.
 - m. Alkali and mildew-resistance.
5. If results show materials being used do not comply with specified requirements, Contractor may be directed to stop work and remove noncomplying materials, pay for testing, recoat surfaces coated with rejected materials, and remove rejected materials from previously coated surfaces if, on recoating with specified materials, two coatings are incompatible.

3.05 CLEANING AND PROTECTION

A. Clean-Up:

1. At end of each work day, remove from site discarded paint materials, rubbish, cans, and rags.
2. On completion of painting work, clean window glass and other paint-spattered surfaces.
3. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

B. Protection:

1. Protect work of other trades, whether or not to be painted, against damage by painting and finishing work.
2. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
3. Provide WET PAINT signs as required to protect newly-painted finishes.
4. After completion of painting operations, remove temporary protective wrapping provided by others for protection of their work.
5. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

3.06 INTERIOR AREAS COATING SYSTEM

- #### A. Sustainability:
- Zero VOC (including tints), containing no formaldehyde, ammonia, crystalline silica, or ethylene glycol per Scientific Certification Systems (SCS) or Green Seal.

- B. Systems: Compatible primer and 2 finish coats.
- C. Primer: As suited for substrate and same manufacturer as finish coats, with Zero VOC to Low VOC content allowed.
- D. Finish Coats:
 - 1. Eggshell for walls; semigloss for bathrooms, kitchens, and trim.
 - 2. Products: AFM Model Safecoat with Zero VOC Colorant (priming and sealing new or previous drywall, wood, and other porous surfaces), Benjamin Moore Model Natura (priming and sealing new or previous drywall, wood, and other porous surfaces), Home Depot Model Freshaire with Zero VOC Colorant (priming and sealing new or previous drywall, wood, and other porous surfaces).
- E. Alternate Finish Coat: Pittsburgh Paints Model Pure Performance (Zero VOC) with Voice of Color Colorant (adds VOC to Finish Coats); can be used only if LOW VOC is acceptable to Owner, Sherwin Williams Model Harmony (Zero VOC) with Blend-A-Color Colorant (adds VOC to Finish Coats); can be used only if LOW VOC is acceptable to Owner.

3.07 ENCAPSULANT COATING SYSTEM

- A. Comply with requirements specified for hazardous materials. in Section 028433 – Removal and Disposal of Polychlorinated Biphenyls. Section 028443 provides minimal requirements for encapsulant location, performance, cleaning, managing of surface preparation wastes and worker health and safety, If there is a conflict between the requirements of Section 028433 and 099100 regarding these topics, the requirements of Section 028443 shall prevail.
 - a. If sanding is required between applications all dust must be contained to the immediate work area, collected and managed in accordance with Section 028433.
- B. System shall consist of multi-layer epoxy spray-applied. Single coat of primer, one finish coat of color 1, one finish coat of color 2

3.08 EXTERIOR AREAS COATING SYSTEM

- A. General:
 - 1. Following finish coatings schedule is based on products of Benjamin Moore to establish minimum quality of coatings.
 - 2. Equal or better products of ICI Dulux or Sherwin Williams are acceptable when supporting technical data is submitted in compliance with requirements of Section 012500.
 - 3. Provide primers and undercoat coatings produced by same manufacturer as finish coats.
- B. Wood:
 - 1. Opaque-Painted - Soft-Gloss Finish:
 - a. System: 2 finish coats over primer coat.
 - b. Primer Coat: Benjamin Moore Moorwhite Primer #100.
 - c. First and Second Finish Coats: Benjamin Moore MoorGlo Latex House & Trim Paint #096.
- C. Ferrous Metal:
 - 1. Opaque-Painted - Soft-Gloss Finish:
 - a. System: 2 finish coats over primer coat.
 - b. Primer Coat: Benjamin Moore IronClad Retardo Rust Inhibitive Paint #163,

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except use oil-based primer where passivator has been removed.

- c. First and Second Finish Coats: Benjamin Moore MoorGlo Latex House & Trim Paint #096.

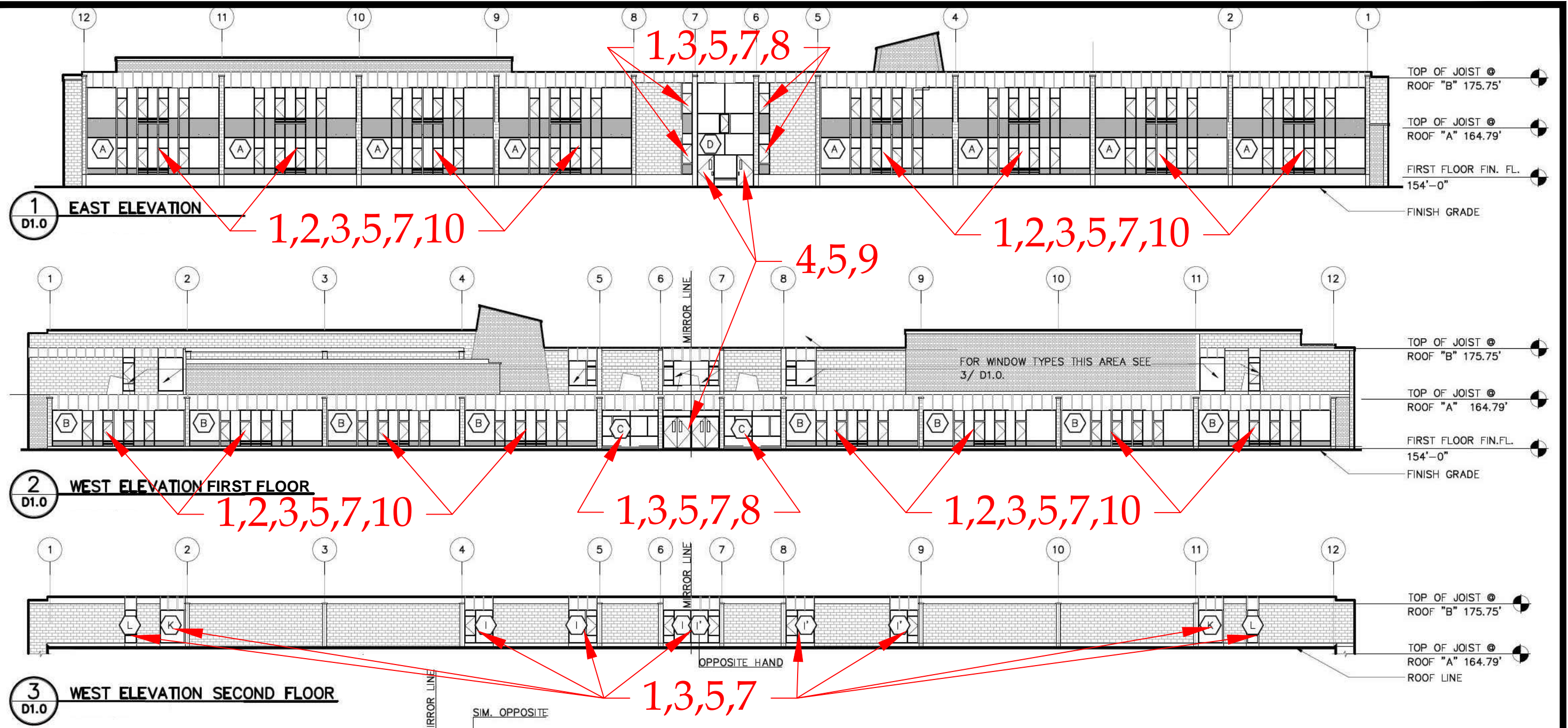
D. Exterior Soffit:

- 1. System: 2 finish coats over primer coat.
- 2. Primer: Benjamin Moore Moorwhite Primer #100.
- 3. First and Second Finish Coats: Benjamin Moore MoorGard Latex House Paint #103.

END OF SECTION

Appendix D

Plans – PCB Containing Building Material Extents



PCB Bulk Product Wastes	
Id #	Material
1	Interior and Exterior Window Frame Caulk
2	Interior Window Sill at Univent Rubber Sealant
3	Interior Window Glazing
4	Exterior Door Frame Caulk

PCB Remediation Wastes	
Id #	Material
5	Window and Door Assemblies (includes: exterior window glazing, window panes (lights), metal panels, and frames unless decontaminated prior to removal)
6	Interior Wooden Window Sill

PCB Remediation Wastes	
Id #	Material
7	Exterior CMU Window Surround/Concrete First Floor Sill
8	Exterior Brick Window Surround/Concrete First Floor Sill
9	Exterior Concrete Tresholds
10	Univent Metal Interior, Debris, Insulation and Exterior Louver



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PCB CONTAINING BUILDING MATERIAL EXTENT

BURKE ELEMENTARY SCHOOL
127 BIRCH STREET
PEABODY, MASSACHUSETTS

PROJECT NUMBER:
060.41546.0006

SCALE:
NOT TO SCALE

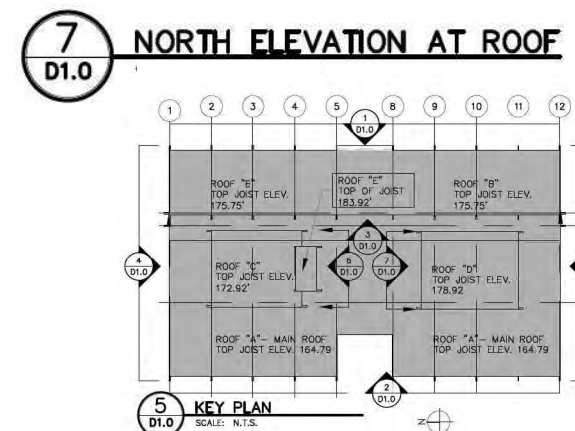
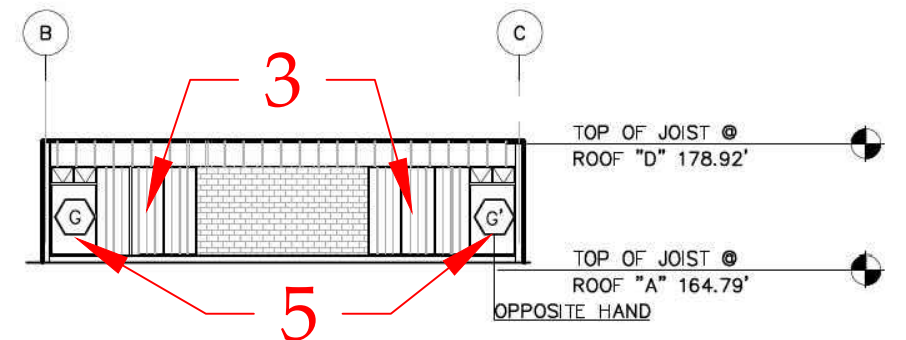
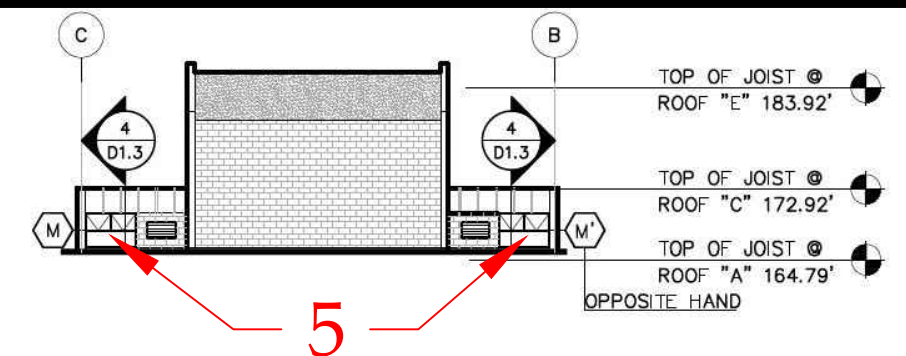
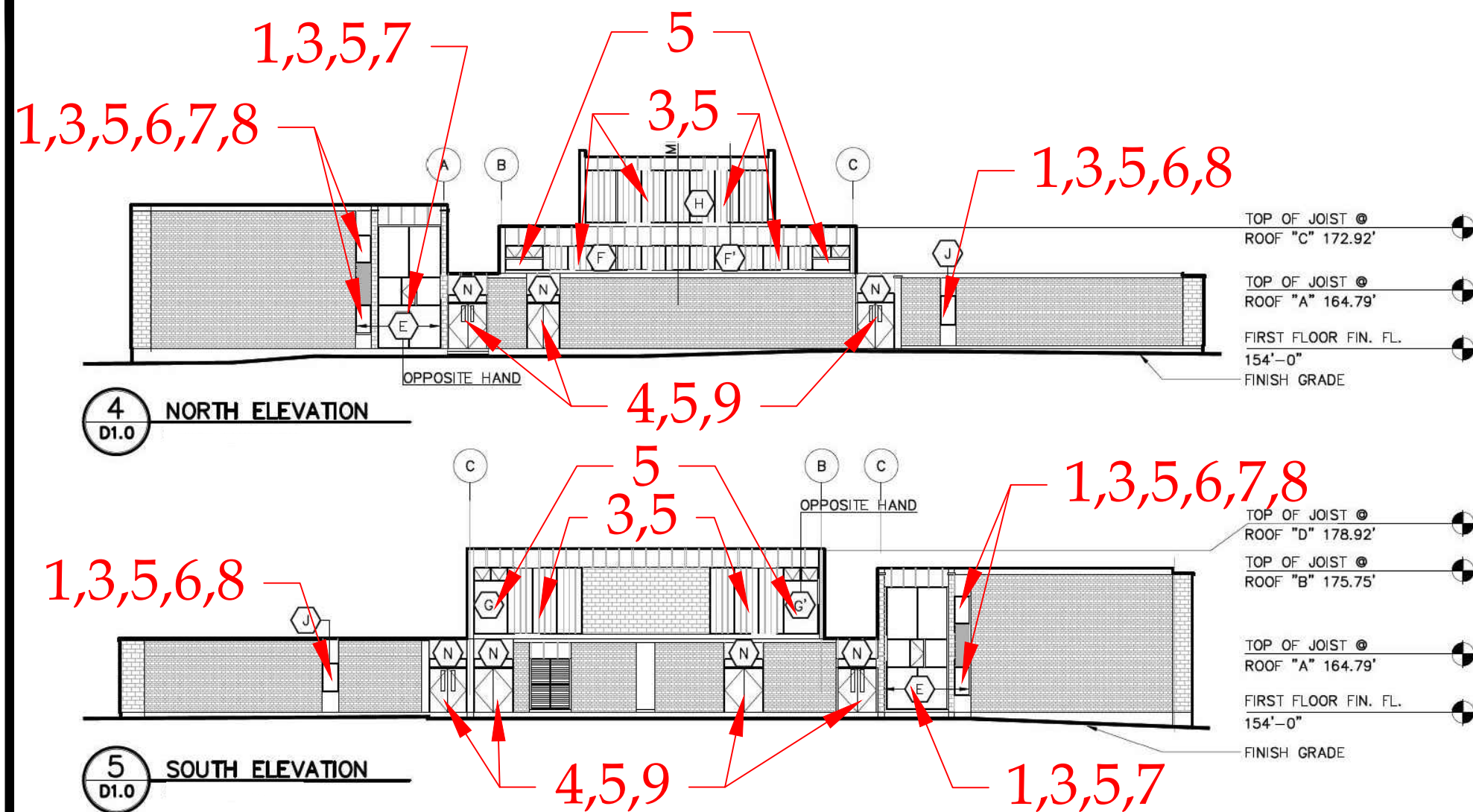
FILE:
PCB MATERIAL LOCATION PLAN

BASE FIGURE SOURCE: SHEET D1.0 - DEMOLITION ELEVATIONS, KEY PLAN, LPBA Architects, Inc. 12/9/11

PLAN:
D-1

DATE:
MARCH 26, 2012

DRAWN BY: CA
CHECKED BY: MG



PCB Bulk Product Wastes	
Id #	Material
1	Interior and Exterior Window Frame Caulk
2	Interior Window Sill at Univent Rubber Sealant
3	Interior Window Glazing
4	Exterior Door Frame Caulk

PCB Remediation Wastes	
Id #	Material
5	Window and Door Assemblies (includes: exterior window glazing, window panes (lights), metal panels, and frames unless decontaminated prior to removal)
6	Interior Wooden Window Sill

PCB Remediation Wastes	
Id #	Material
7	Exterior CMU Window Surround/Concrete First Floor Sill
8	Exterior Brick Window Surround/Concrete First Floor Sill
9	Exterior Concrete Tresholds
10	Univent Metal Interior, Debris, Insulation and Exterior Louver



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FILE:
PCB MATERIAL LOCATION PLAN

PLAN:
D-2

DATE:
MARCH 26, 2012

DRAWN BY: CA
CHECKED BY: MG

BASE FIGURE SOURCE: SHEET D1.0 - DEMOLITION ELEVATIONS, KEY PLAN, LPBA Architects, Inc. 12/9/11